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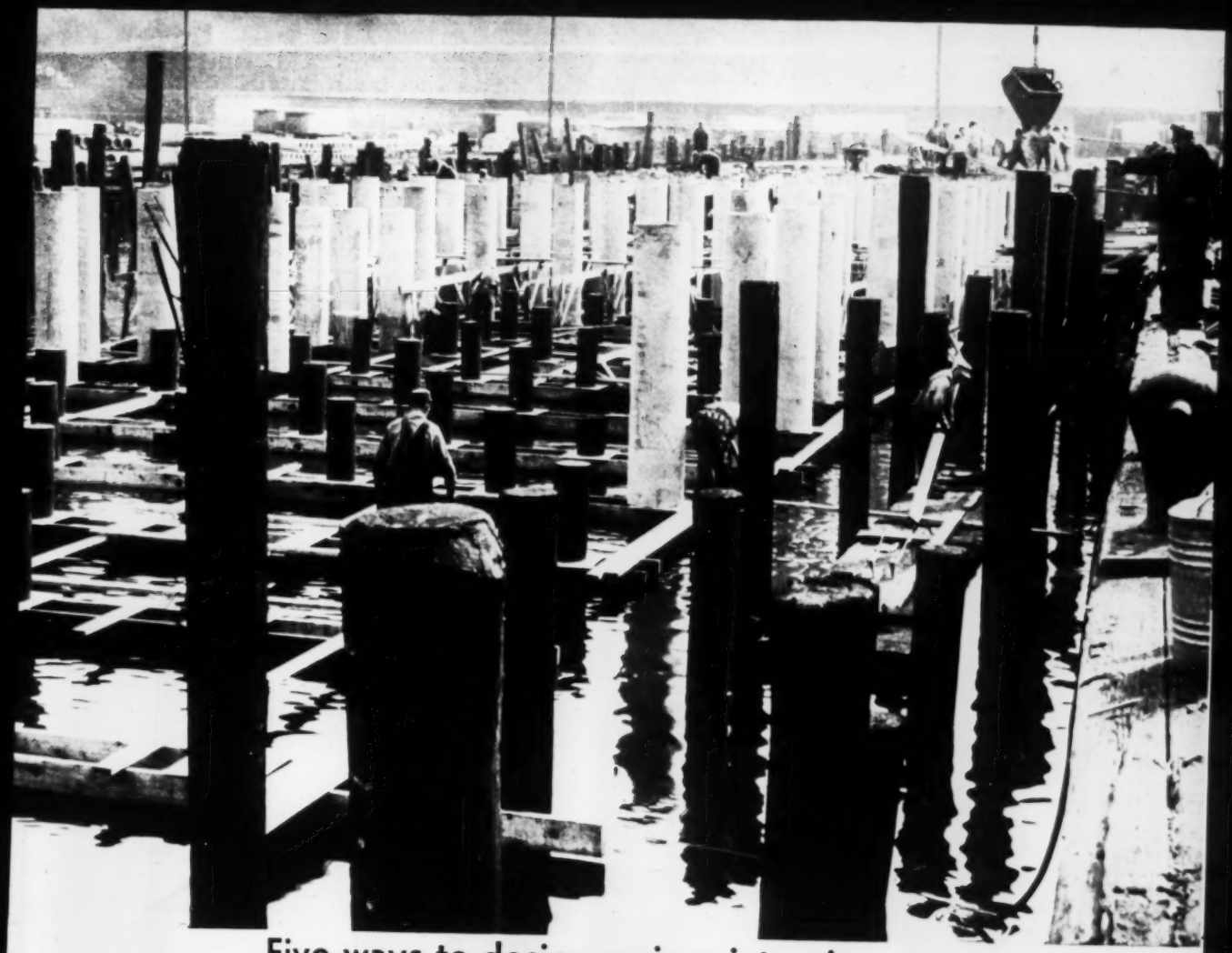

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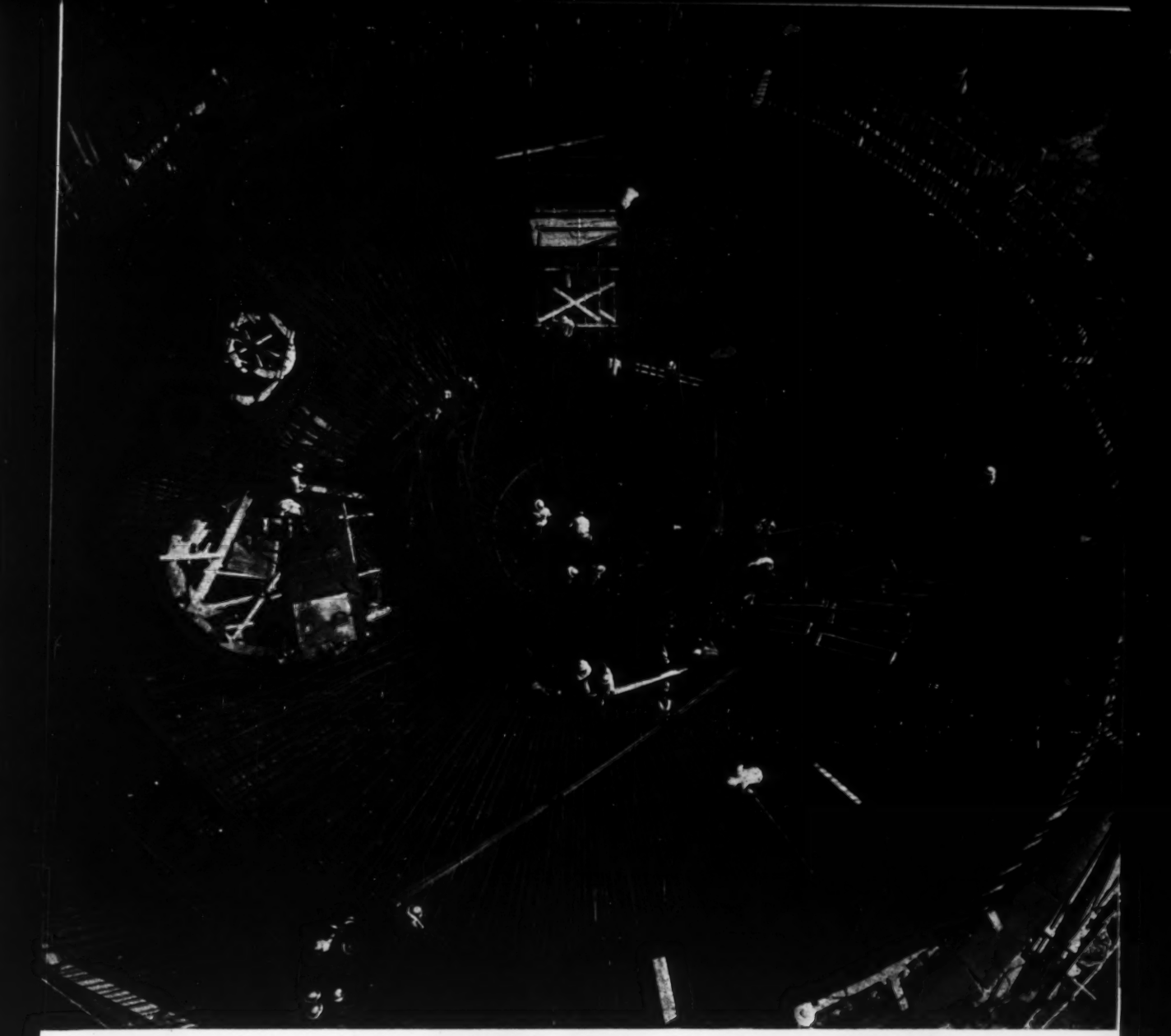

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"Universal's pipe with flexible rubber joints already assembled are really the answer to tough pipe-laying conditions like these," stated Fred Gorenflo, Resident Engineer on this sewer installation project in Millcreek Township, Erie, Pa

The "tough conditions" referred to are best described by C L. Herman, Contractor on the 18" Universal Pipe section shown above. He said. "Flooded, 21-foot deep trenches ran beside and below the level of a creek. We worked in water all the way, but Universal Pipe with Tylox Gaskets made pipe-laying a cinch. It took only seconds to make each joint."

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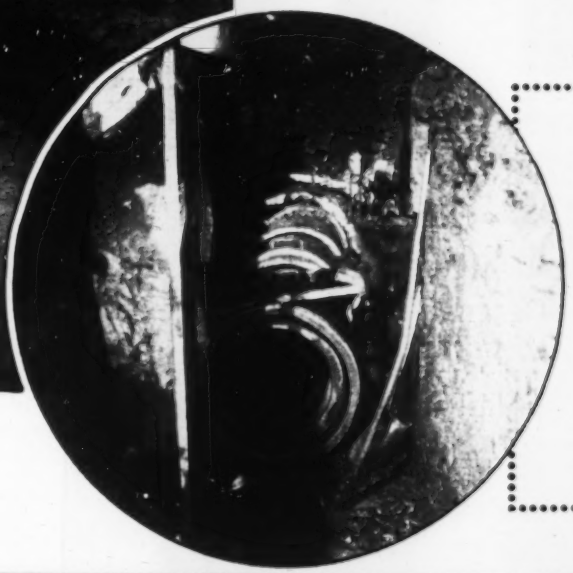

PROJECT: Sanitary sewers, Millcreek Sewer Authority, Millcreek Township, Erie, Pa.

ENGINEERS: Consoer, Townsend & Associates, Consultants, Chicago, Ill., and Pittsburgh, Pa. Fred Gorenflo, Resident Engineer

CONTRACTOR: C. L. Herman, Erie, Pa., in charge of section using 18" Tylox-Coupled Universal Vitrified Clay Pipe.

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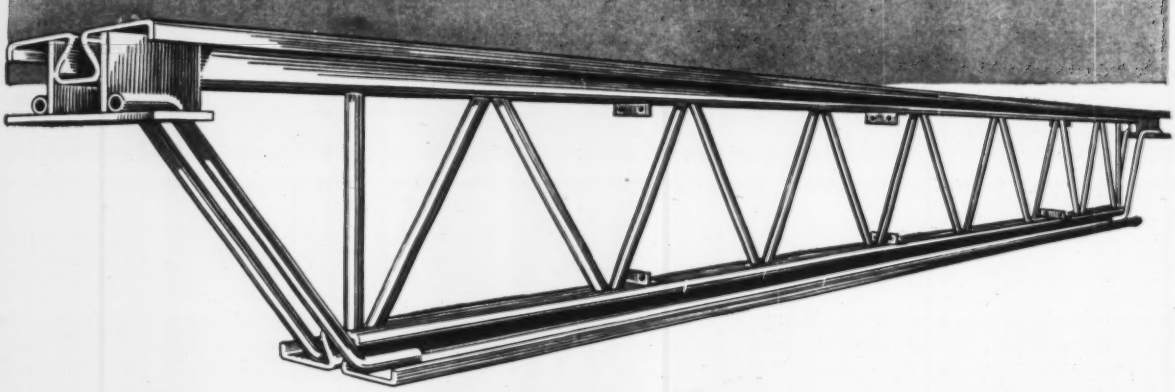

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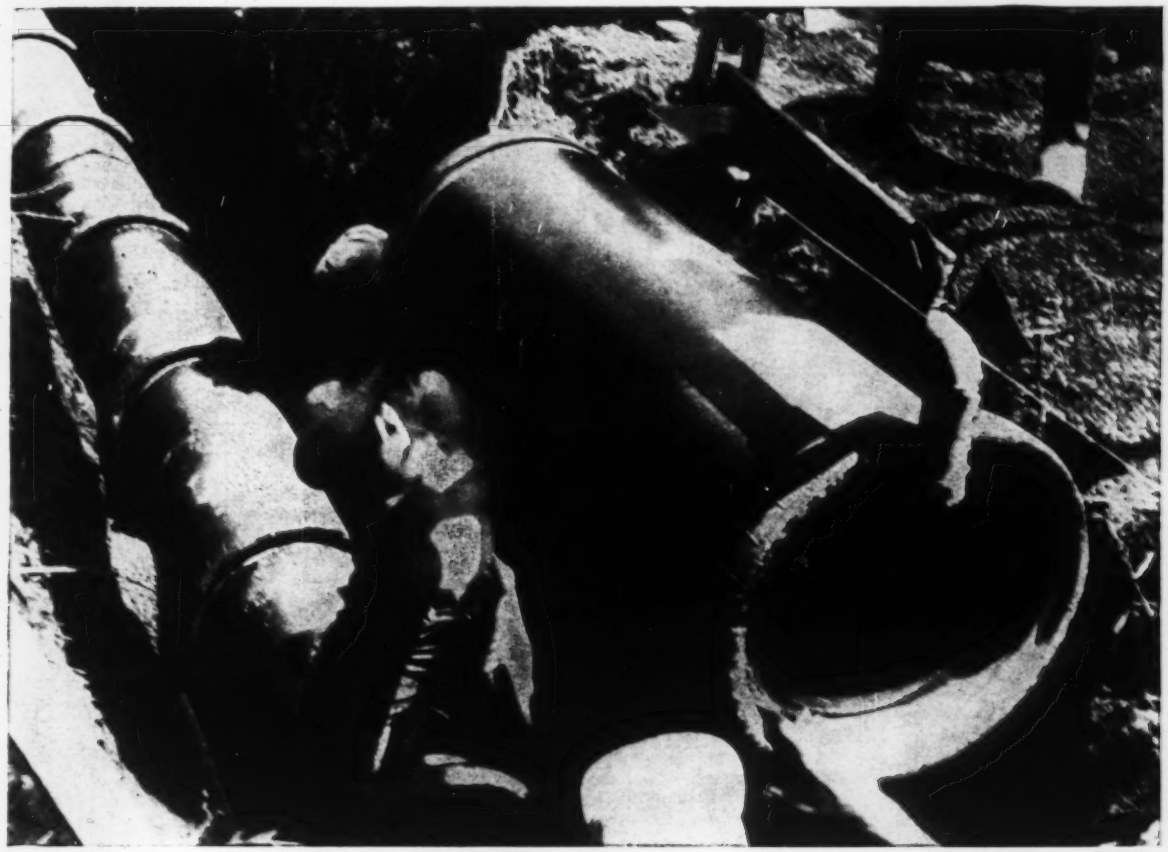

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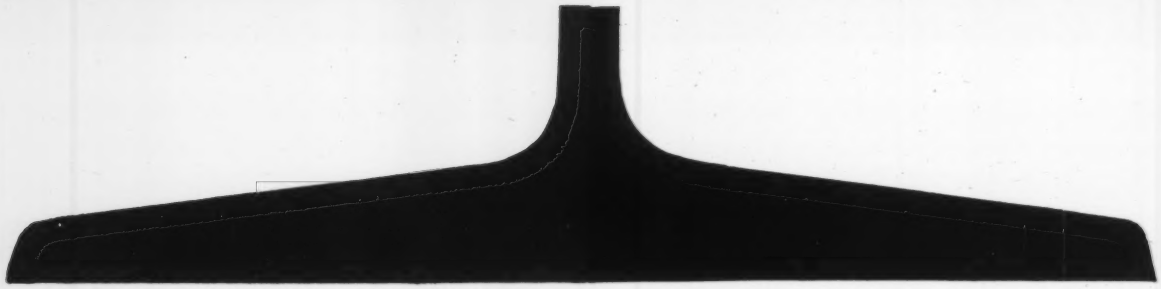

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Collapse in Steel Frames: Why, How, Who

SIR—Your editorial "Design Against Sidesway" (ENR May 21, p1. 128) touches on a timely subject.

Many of the provisions in building codes are the result of past experience, based on construction heavier than much that is being built today. For instance, older buildings, in general, featured greater live loads, heavier floors and roofs, wall-bearing, with piers or pilasters where required, 12-in. masonry curtain walls, floor-to-floor partitions, and more of them, etc.

Today's buildings tend towards large glass areas, light curtain walls often prefabricated and hung or clipped in place, light sheating materials for walls and roofs. Open planning eliminates many partitions which are lighter and often do not run full height. Coupled with this, higher unit stresses have come into use.

As a result, frames are lighter and do not receive much help from walls and partitions. And the 133⅓ of normal stress which is usual allowance for DL plus LL plus Wind, does not always suffice. In any event, moments must be carried by proper connections if diagonal bracing is not used. The safety factor has been whittled away in many cases.

The U. S. Department of Commerce, Bureau of Standards, Building Materials and Structures, report #152 "Wind Pressures in Various Areas of the U. S.," based upon actual readings, give 25# psf. and more for buildings less than 30 ft-0 in. high, over large areas of the U. S.

With the foregoing facts in mind, an analysis will reveal many industrial and commercial buildings recently built and under way are not safe. The lending institutions and insurance companies, as well as public officials, would do well to take cognizance of the situation.

All this points up:

- The need for a more critical study of all elements preliminary to structural design.
- The need for competent engineering, even for "simple" buildings, which too often do not receive it.
- The need for engineering supervision which would prevent many abuses during construction, and in some cases detect design inadequacies.

ARTHUR E. ROWE
Cleveland, Ohio

▶I agree completely with the philosophy of your editorial, but I cannot agree with all your conclusions.

Quite a number of structures have been built in recent years without adequate provision for wind. Some of these have collapsed, others have required remedial measures after showing signs of distress, and others gain stability from sources that had not been counted on structurally—such as curtain walls and partitions.

It comes as a surprise that the New York City Code states wind pressure may in general be neglected on structures 100 ft high or less. All other codes state that structures *shall* be designed to resist wind. Contrary to your interpretation of the AISC specification, I believe the codes adequately state this requirement. Of course, it is not always necessary for an experienced engineer to calculate wind stresses, for it is often obvious that wind is adequately taken care of or that minimum size members are sufficient.

City Building Departments must share blame where structural design is inadequate, for again, it is often obvious by inspection of plans that no provision has been made for wind and building permits should have been refused.

During erection, contractors should always be aware of bracing needs and recognize where the resistance to wind is provided in the completed structure. This is true, too, in the case of shoring and scaffolding. There have been failures of these due to little or no provision for horizontal forces.

Finally, the writer wishes to take issue with your use of the word "sidesway". This term normally is thought of as a correction made in the analysis of frames by moment distribution. The heading of your editorial implied to me and several of my colleagues that the collapse of the Westbury building was due to failure to make this correction in the analysis. More appropriate terms for the problem you have in mind are "Lateral Force Analysis" or "Horizontal Load Analysis".

JAMES CHINN
Associate Professor
University of Colorado
Boulder, Col.

▶I wish to add my plea to that of Mr. J. Stanley Jeffery, (ENR May 14, p. 16) for more information regarding the causes of engineering failures. Of the failures recently reported by ENR I can recall only those of the U. S. Air Force Base Warehouses as having been adequately reported so that engineers could learn what error caused the failure and so could avoid making similar errors. These were excellently reported, no doubt because of the importance of the structures and also because the information was made available to you.

Information regarding failures is often withheld to protect those who are responsible or who may be blamed. Surely there must be some way to obtain information regarding such matters of public concern as building failures which cause property damage, personal injuries, and loss of life. If only details of design and methods of construction of the failing structures could be made public without blaming any one, many engineers could spot the weaknesses so that they and others would be warned to avoid similar designs and methods.

In the same issue is a report of the failure of a factory frame. Enough information is given so that a pretty good guess can be made as to the cause of failure. It would have been helpful if the weight of the columns and size and weight of the beams and girders had been given. If the detail of the connection between the beams, girders and columns is as would be inferred from the description it is not difficult to understand what may have caused the failure.

The girders were continuous over the columns so the bottom flanges were in compression at the supports. This would produce lateral deflection at these points. There apparently was nothing to resist or limit this lateral deflection except the resistance to vertical bending provided by a weak connection between the girders and the columns. The slightest initial deflection of the tops of the columns would be augmented by the vertical load on the girder and progressive failure would become almost certain. With nothing to limit deflection of the tops of the columns, nor of the whole slab, in the direction parallel to the beams, the failure of one column could cause the whole roof to collapse, as it did.

It may be that had the walls been in place, with the roof slab firmly attached to the walls, the failure (at least in its entirety) might not have occurred. The walls would have limited the movement of the slab in the direction parallel to the beams and perhaps complete failure would have been prevented. However even with the walls in place every interior column would still be a point of possible failure because of the lack of adequate lateral support at the top of the wall.

This lateral support could probably have been provided by knee braces between the tops of the columns and the beams directly above. These knee braces would not be wind or sway bracing but would prevent lateral deflection of the bottom flanges of the girders and of the tops of the columns.

C. S. BUMANN
Consulting Engineer
Springfield, Mo.

(Reader Comment continued p. 10)

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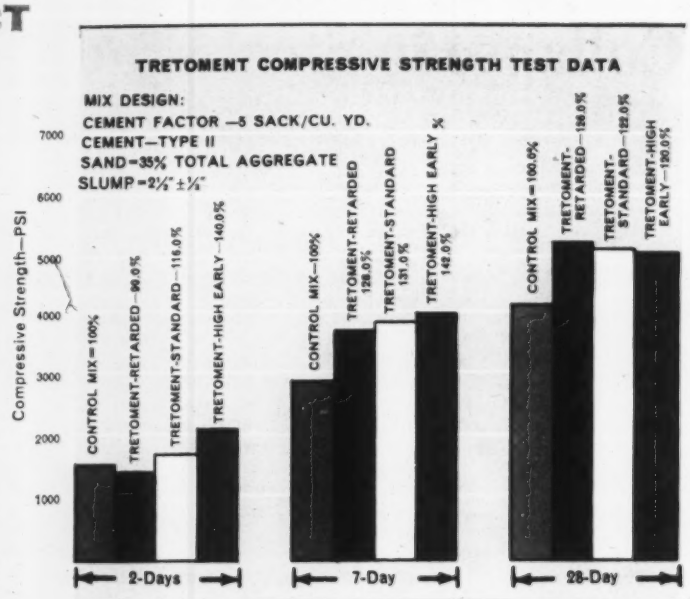
Now . . . TRETOMENT Standard, Retarded, or High Early powder or liquid concrete admixtures assure perfect concreting to precisely meet all specifications . . . regardless of delivery, site or climatic conditions. With usual water-to-solids ratios, TRETOMENT admixtures increase slump as much as 15%. With up to 20% less water in the mix, TRETOMENT provides equal slump and greater workability or plasticity, reduces capillary network, voids shrinkage and cracking. As shown on the chart at right, TRETOMENT increases compressive strength as much as 25%, with a corresponding increase in flexural strength and up to 40% greater bonding strength to steel. Mixes incorporating TRETOMENT admixtures entrain normal amounts of air, meeting all ordinary requirements. By providing positive control of the rate of hardening and set, TRETOMENT admixtures simplify handling, assure ideal finishing conditions for fine workmanship, and produce more durable, longer-lasting concrete.



This chart shows how the three TRETOMENT concrete admixtures modify the physical characteristics of a concrete mix to produce predictable results to meet specific requirements.

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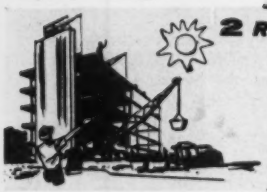
Increases the overall strength and bond of concrete to steel. Assures easier placement and a more economical mix. Improves the handling and finishing of the mix. Reduces the permeability, shrinkage and cracking. Offers resistance to freezing and thawing, salt water and sulphates.



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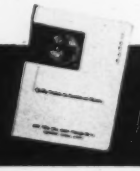

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Bryan Carl, Partner, Dean Word Co., New Braunfels, Texas

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Look at the ratings on the new DW20-No. 482. To handle the increases in horsepower, rimpull and scraper ratings, both tractor and scraper have been improved in design and structure. The tractor, for example, has stronger final drives and improved transmission forks. The scraper has a stronger bowl, push frame, draft frame and apron. Result: better service life, less maintenance and cheaper dirt.

Here's a four-wheel rig that meets your needs for higher, more economical production on today's big jobs. Ask your Caterpillar Dealer for complete facts about it. See for yourself how the new DW20-No. 482 can step up your production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

NEW DW20-No. 482

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NEW RIMPULL	—39,565 lb. (maximum)—increased 12%	
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For the Record on Vacuum Cooling

SIR—Your article "New Way To Cool Aggregates—By Steam" (ENR Apr. 9, p. 38) will interest many engineers connected with construction work involving concrete in large quantities.

We congratulate the Guy F. Atkinson Co. on its willingness to pioneer this new vacuum-cooling process as applied to aggregates. We think it a little unfair, however, that J. A. Jones Construction Co., which pioneered the vacuum-cooling process on sand, is not also mentioned. All heavy construction men who have had concrete-cooling problems know that sand is much harder to cool than gravel or coarse aggregates. Several cooling processes for the latter have been available for many years, and have been applied on many large dams.

It seems to us that when J. A. Jones Construction Co. installed the first commercial sand cooler on their Derbendi Khan project in Iraq, they made engineering history.

Mr. John R. Hightower, who was then a consulting engineer and inventor, and is now a full-time employee of the Willamette Iron & Steel Co., Atkinson's subsidiary, should also receive some credit. The same applies to our firm. Mr. Hightower and Croll-Reynolds Co. jointly designed the vacuum sand cooler for the Derbendi Khan project. We also designed and tested a pilot-plant scale cooler for gravel and coarse aggregates long before anyone else did anything whatsoever in this field. John Hightower and Croll-Reynolds have joint interest in an active patent application covering the entire vacuum process for cooling sand and aggregates.

Much of the development work was done by Croll-Reynolds Co. at a time when Mr. Hightower was in Turkey and other foreign countries for nearly two years. On our test floor at Weatherly, Pa., we have had many visitors to see cooling of sand and aggregates as far back as 1954.

Your article gives the impression that the Atkinson Co. did all the designing and development of the vacuum-cooling process for aggregates. We take exception to this. We also take exception to a sentence near the end of the first column of your article: "The company [Guy F. Atkinson Co.] designed and built the cooling plant with conventional pressure tanks, boilers and steam-jet vacuum equipment." The jet compressors, which are the heart of the cooling system described in your article, are of a special design to give maximum efficiency over the temperature range represented by the estimated maximum aggregate temperature and the desired minimum temperature.

Vacuum manifolds and other important parts of the vacuum system are far from conventional. The shells of the various vacuum vessels can be called conventional. The outer shells of some boilers can also be called conventional pressure tanks, but they never are, and such a statement would be most misleading.

The same is true in the case of cooling tanks. Each tank is a highly specialized evaporator. At the moment, we will refer only to the sand tanks, which have a very elaborate system of louvers to permit proper penetration of vacuum into, and throughout, the big bulk of sand.

The special vacuum equipment involved was designed by our chief engineer, Mr. James T. Reynolds. Our head design engineer, Mr. John Knoble, was sent to California to work with Atkinson engineers, including Mr. Hightower, on layout of the vacuum manifolds, etc. Both Mr. Knoble and Mr. Reynolds went to the Hartwell project on urgent request of Atkinson engineers to work on problems involved in start-up and testing of the special vacuum equipment.

D. H. JACKSON, *President*
Croll-Reynolds Co., Inc.
Chemical & Mechanical Engineers
Westfield, N. J.

Tune In on Weather

SIR—A few days ago, I invited a contractor friend of mine to go for a ride in my new airplane. Before leaving home, I tuned in the Federal Aviation Agency's weather navigation station in Chicago. As he heard the sequence of up-to-the-hour weather reports from a series of stations surrounding Chicago, he said, "How long has this been going on?"

He said that many times during the year he has called the local airport to get up-to-the-hour weather information so that he could decide whether or not to concrete, etc. He also said that he had never known that this information was broadcast twice an hour by the FAA stations.

All of which makes me wonder if your readers might not be interested in knowing about this weather service. It has been on the air for many years, but until quite recently was unavailable to the general public because there was no equipment on the general market that would tune the stations.

That situation has changed. There are now at least three makes of portable radio on the market which will tune the 200-400 kc band on which the FAA stations are located.

The FAA weather broadcasts come from a network of several hundred weather navigation stations located throughout the country. (The Canadian Government operates a similar network in the Dominion.) At fifteen minutes and forty-five minutes after each hour most of these stations broadcast weather sequences. The first sequence in the hour gives conditions as they were twenty minutes earlier at the reporting station, and at from eight to twelve stations located in all directions at distances of up to approximately 100 miles.

The conditions reported include temperature, dewpoint, wind direction and velocity, visibility, state of weather and barometric pressure.

In addition, the stations give advisories of storm conditions existing within 200 miles.

TED LEITZELL
Zenith Radio Corp.
Chicago, Ill.

Nursing Home Approvals

SIR—I noted with interest the statement in "Construction Week" (ENR May 14, p. 21) concerning approval of plans for nursing homes in New York State.

The State of Michigan has required that plans and specifications for all new nursing homes as well as additions or major renovations be approved by this department since July, 1957. The homes must meet construction standards set forth in the rules and regulations of this department as well as fire standards developed by the Michigan State Fire Marshal in March, 1957. Licensed homes must also meet local building, housing and zoning requirements. This applies to existing homes as well as those under construction.

All plans and specifications for new homes, additions and major alterations must be prepared by a registered architect or engineer.

VINSON R. OVIATT
Consulting Engineer
Michigan Dept. of Health
Lansing, Mich.

Backward-Bridge Project

SIR—Referring to your article "Contractor Erects Bridge, Then Digs Underpass" (ENR May 21, p. 38), describing the Montrose Avenue Bridge in Cook County, I believe that your readers should be aware of the following

(Reader Comment continued p. 16)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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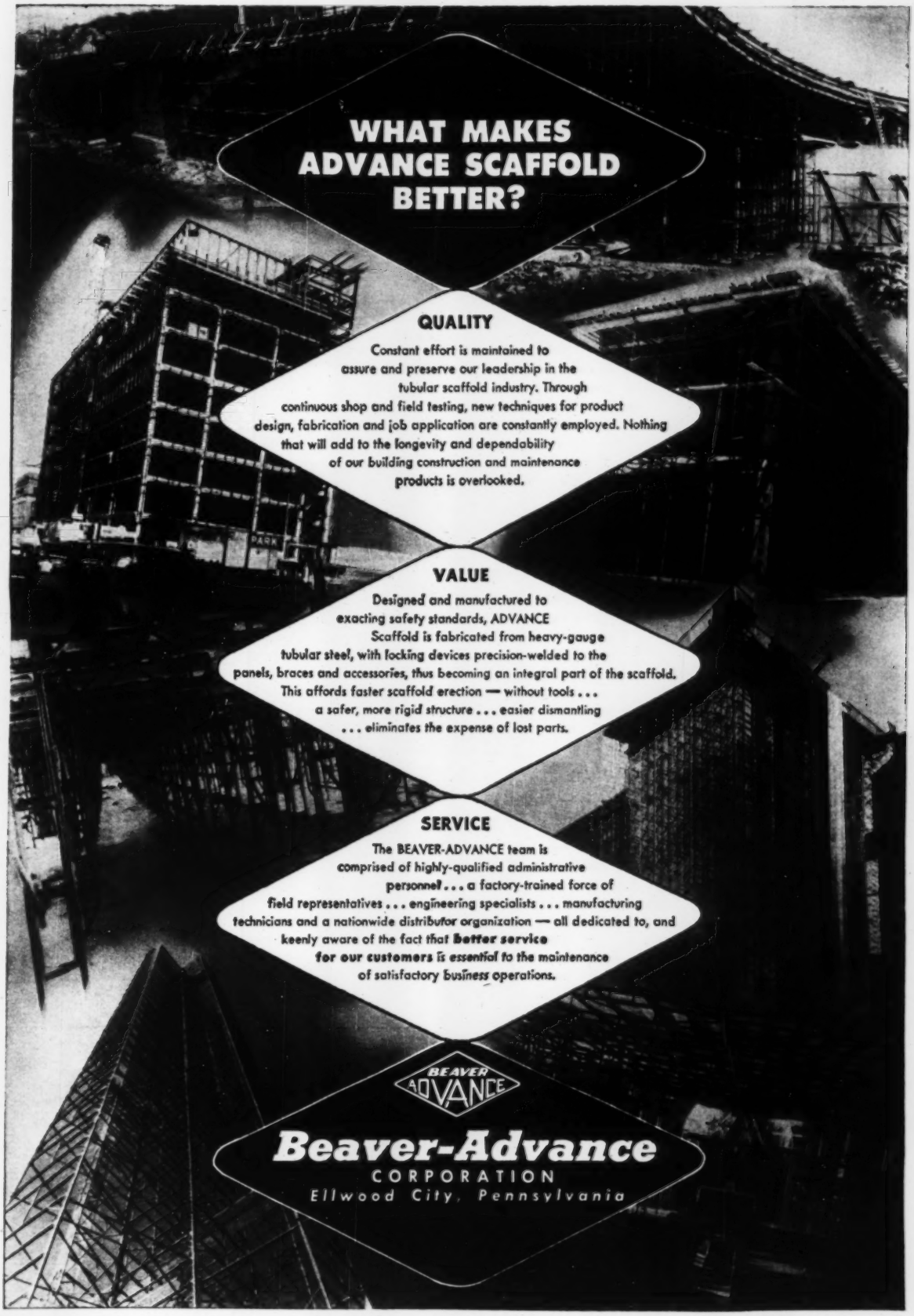
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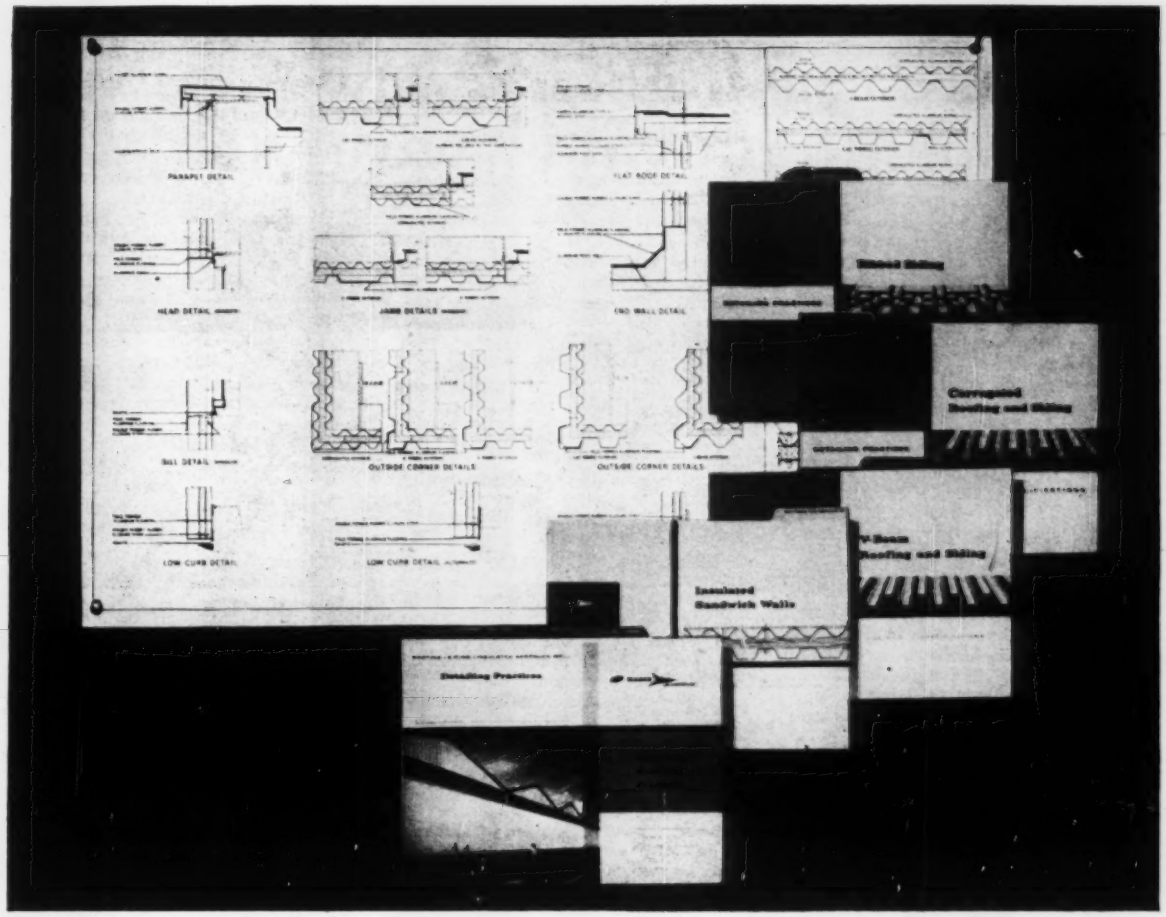

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Monorails: A Step Backward?

SIR—In your article describing the Disneyland Monorail (ENR May 7, p. 34) you point out that "primary advantages of monorail are incorporated. These are the fast acceleration of the direct current electric drive and the smooth riding qualities of rubber tires on carefully constructed beams." These advantages do not appear to me to be a part of monorail in any way, as they can also be obtained with any modern conveyance.

You also dwell so strongly on "monorail" that you published an editorial on it (ENR May 21, p. 128). In none of these has there appeared any real arguments or factual advantages of the monorail over any other form of transportation.

It seems more of a promotional scheme, rather than having engineering advantages.

The real problem in rapid transit is the terminal, whether it be San Francisco, New Orleans, New York, Caracas, Sao Paulo, Los Angeles or any other large city. The problem that is still unsolved is how to deliver thousands of people in a small area within fifteen minutes before nine o'clock. This problem is not solved by the type of car or the type of rail.

If there are some very real advantages in the monorail, serious engineers would like to have them carefully outlined, because the general public is frequently misled by somewhat extravagant claims of those interested in the monorail.

W. P. KINNEMAN
Chief Civil Engineer
Raymond International, Inc.
New York, N. Y.

▶ Your editorial, "Never a Bride", (ENR May 21, p. 128) was disappointing. At a time when so much effort is being devoted to improving the appearance of cities, with the gradual removal of all overhead impedimenta, surely it is a retrograde step even to contemplate any reversal of this kind by putting back elevated railroads, even if they do have only one rail instead of two.

The answer to your rhetorical question is surely clear for all to see. If the monorail does provide sensible and economical mass urban transportation, why should the Wuppertal installation have remained for 50 years as the only one of its kind in the world?

ROBERT F. LEGGET
Ottawa, Canada

▶ You state that Wuppertal, Germany, is near Berlin. Wuppertal is nearly 300 miles from Berlin, but Dusseldorf is only 10 miles from the western terminus of the Wuppertal "Schwebebahn." I rode in a train on this "Schwebebahn" on the day it was opened, nearly 60 years ago.

There are over 500,000 inhabitants in the area served by this monorail system, which has carried almost one billion (not million) passengers since it was placed in operation.

W. STEINBRUCH
Ardmore, Pa.

EDITOR'S NOTE—Making a billion into a million was a typographical error, but creating a new "Berlin crisis" by incorrectly placing Wuppertal far from its proper location near Dusseldorf was an editorial slip, which several readers noted. One of them added additional data on the Wuppertal monorail: It is of the suspended type, has a length of nine miles and was built in 1898. Part of it is over a river and part over a road. The clearance over the river is 36 ft and over the road 24 ft. It speed is 37 miles per hour with a capacity of 80 people per car. The fare is 10 cents. The system has carried 826 million passengers since its opening; 20 million since 1955. There is no record of any serious accident.

Chiefs and Indians Make a Tribe

SIR—Let me second the assertion that T. H. Evans, Dean of Engineering, Colorado State University, makes in his Reader Comment (ENR April 23,p. 9). Dean Evans, in speaking of professional unity, calls for the banding together of the Indians, not just the chiefs.

He has, I believe, hit the nail on the head.

As a member of the American Society of Civil Engineers I have repeatedly heard the criticism that engineering management runs the ASCE.

The American Society of Civil Engineers as well as the other Founder Societies, if they are to survive the inroads being made by unions on their membership, must grant representation to all of their members. The answer is obvious and urgent—include a true cross section of the membership in the policy-making groups or boards of the engineering societies—include the employee as well as the employer, the young as well as the elder statesmen. With more Indians made to feel that they are part of the tribe, too, the engineering profession can take a giant step forward in rectifying one of its greatest shortcomings.

It will be taking the first step in effectively turning away the challenge of unions for engineers.

WALTER D. LINZING
Harza Engineering Company
Chicago, Ill.

Plastic Design Questioned

SIR—I would like to question the advisability of using the plastic-design method for the roof structure described in "Plastic Design Cuts Grocery Bill" (ENR April 30, p. 39).

With an assumed girder span of 48 ft, I find that by designing with the elastic theory, a 16 WF50 section may be used throughout with a 7-ft cantilever at each column. (However, I would use 18 WF-50's instead of 16 WF50's.)

I think the plastic theory definitely has its merits and should be used where a saving can be realized. However, in this particular instance it seems that the moment connections are superfluous and could be replaced by an adequate shear connection.

HORATIO ALLISON
Structural Engineer
Rockville, Md.

▶ Plastic design is here to stay and the more we learn of its use, the better. However, during the rising popularity of plastic design, one should not cast aside the advantages of simple hung-beam design.

As all engineers know (but apparently many ignore) in this system a beam is hung from the cantilevered ends of two larger beams, each of which overhangs its two columns. The result is much like the picture in "Plastic Design Cuts Grocery Bill" (ENR April 30, p. 39) but there are no moment connections involved, although the simple positive is reduced by the cantilever negative.

With the popularity of one-story buildings, there is a huge field for this economical design which is so simple to use in both the office and the field. More should be made of this hung-beam system, and engineers with commendable enthusiasm for the new concepts should be reminded of this old-hat method of saving more of their clients' money. It's tried, true, easy and economical.

F. H. MCKNIGHT
Structural designer
Stainback & Scribner, Architects
Charlottsville, Va.

The Sydney Skyscraper

SIR—Having recently visited Sydney, Australia, in connection with the new Australian Mutual Provident Society Head Office Building, which will be Australia's first skyscraper, I was most interested in your article on this project (ENR May 14, p. 66).

It should be noted that, two American firms, both of New York City, have been engaged as consultants on this building—Kahn & Jacobs in connection with the architectural work, and Slocum & Fuller for mechanical and electrical design.

JOHN K. M. PRYKE
Slocum & Fuller
Consulting Engineers
New York, N. Y.

(Reader Comment continued p. 18)

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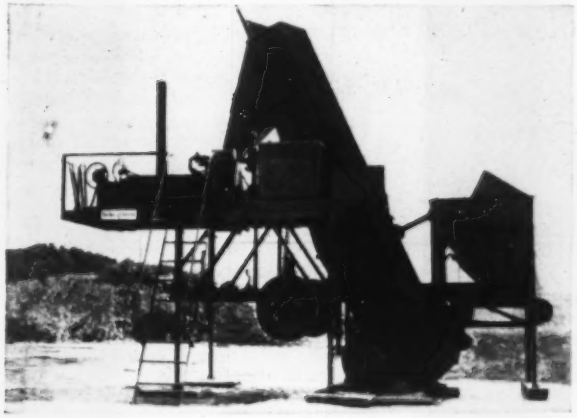

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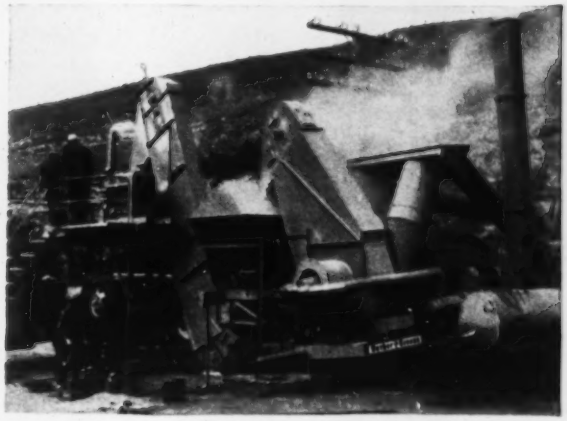
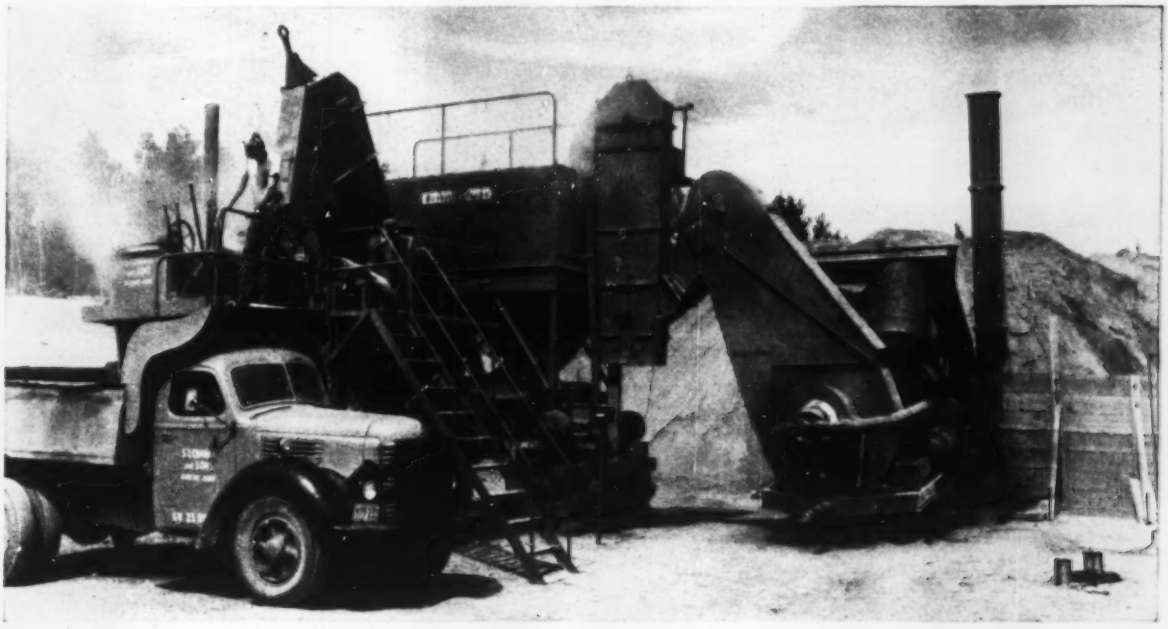


Later add a dryer to produce hot mixes (to 45 t.p.h.) suitable for nearly every type of paving job. With an aggregate feeder to control cold feed gradation, the complete range of hot mixes can be produced—except specs requiring screening after drying.



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corrections and additional information.

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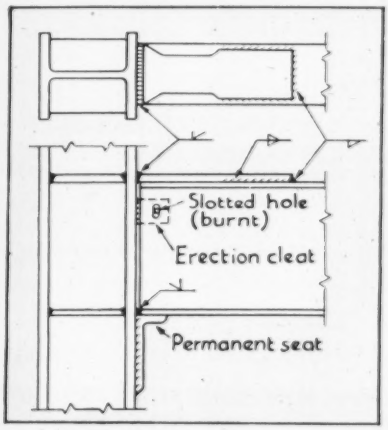
The writer was responsible for the design of this structure, working closely with Mr. M. Page, Cook County Bridge Engineer, as former Chief Engineer of Preload, and supplied an advisor resident, Eugene Marlowe, presently associated with Schupack and Zollman, during the construction.

M. SCHUPACK, *Partner*
Schupack and Zollman
Newtown Square, Pa.



Welded Connections

Sir—Concerning my letter on safety in welded connections (ENR May 14, p. 6), the welded connection in Design C may raise a question concerning adequacy of the shelf detail. Actually any shelf bracket strong enough to take the end shear can be used if there is an erection cleat or other means of safely holding the beam in position until the connection is welded.

Merely bolting the bottom flange during erection to the underseat is not so safe as the method shown in Design G. Furthermore, Design G shows the simplest detail for ordinary loads. The hole in the web can, of course, be burned (and is therefore cheaper than holes drilled in the bottom flange). And burning lets the worker slot the hole, to insure that the erection bolt acts merely as a keeper, allowing the beam to bear fully on the seat below.

DONOVAN H. LEE
Consulting Engineer
London, England

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

MORE VOTERS SAY "NO"—Voters last month rejected 31% of proposed state and local construction bonds, says the Investment Bankers Association. The rejection rate was 20% in March, 28% in April, 29% in May. In June, all waterworks and sewerage bonds passed, only 5% of highway bonds failed; 29% of school issues failed.

LABOR BILL COMING?—Congress may get a new labor reform bill soon. House Education and Labor Committee Chairman Graham Barden (D., N.C.) set July 17 as the target date for committee approval of a reform bill.

ASWAN: STILL A CHANCE?—The West may still be able to take part in building the second stage of Egypt's Aswan Dam. The Russians, now that they have control of the first stage, have been arguing for a merger of the first two stages—but Egypt says no. Second stage covers the main dam section and powerhouse; first stage is the diversion canal and the upstream and downstream cofferdams.

IN CANADA: YES FOR UNITY—Members of the Engineering Institute of Canada like the idea of confederation with the Canadian Council of Professional Engineers. Ballots returned by 30% of the members were 95% favorable. Next move is to set up a 25-man joint committee to prepare a constitution.

WATER OUTLAYS MUST DOUBLE—The U.S. must almost double its investment in development of water sources in the next 16 years, according to a study by the Department of Commerce. About $171 billion is needed to keep up with water demands of the growing population.

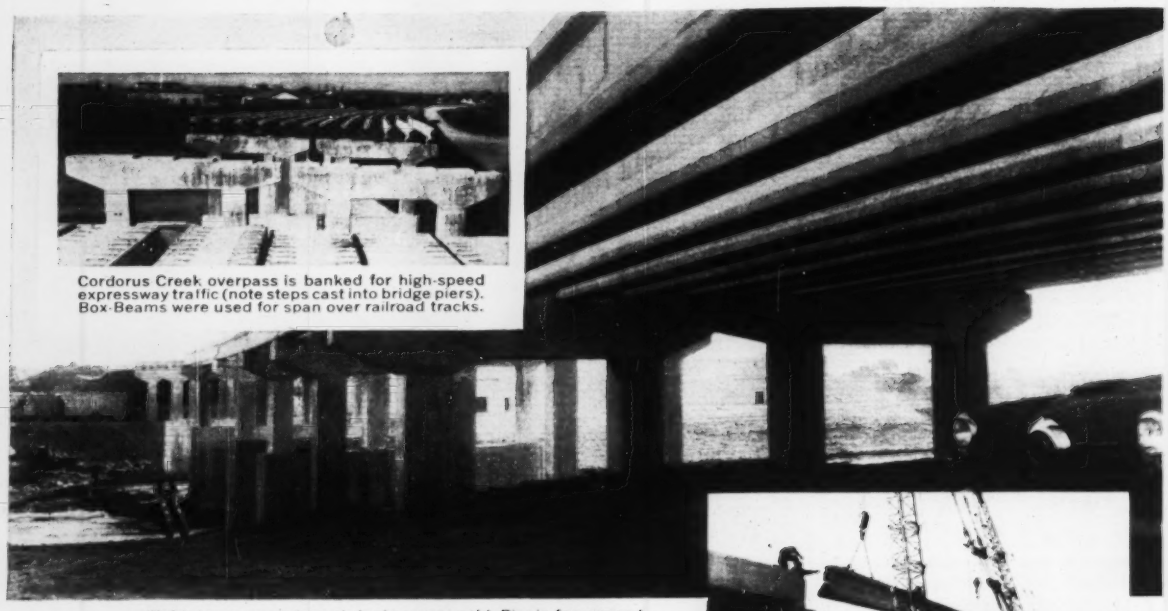
HOUSES AS RAY STOPPERS—The Atomic Energy Commission is seeking a clue to how much protection different types of house construction offer against radioactivity. It is making radiation shielding studies on a half-dozen houses at Oak Ridge, Tenn.

SALINE WATER SPEEDUP—The Office of Saline Water may let construction contracts for the first seawater conversion plant before next June. Its demonstrator plant program has moved ahead faster than expected. OSW has asked Congress for an extra $1.5 million this year.

TUNNEL JOB ON THE BLOCK—Bids are being called for a $20-million vehicle tunnel by the California Division of Highways. The two-lane tube will pass under the Oakland Estuary between Oakland and Alameda counties. It will be 3,350 ft long. Precast sections will be sunk into a trench for the underwater portion. Bids are to be opened September 10.

NEWEST OF PENNSYLVANIA'S

1,000 Prestressed Bridges!



Cordorus Creek overpass is banked for high-speed expressway traffic (note steps cast into bridge piers). Box-Beams were used for span over railroad tracks.

Right, two cranes place girder in severe cold. Pier in foreground accommodates both I-Beams and shallower Box-Beams.

●Starting just ten years ago with the first prestressed concrete bridge in America—the famed Walnut Lane Bridge in Philadelphia—Pennsylvania now has over 1,000 prestressed bridges in place. Under a recent policy of alternate bidding, 75 out of 80 contracts for spans up to 100 feet in length have been awarded to prestressed concrete.

The newest of these projects, and the first to be put out for alternate bidding, is a series of five bridges on the York By-Pass of the new Harrisburg-Baltimore expressway. Ranging from single-span to eight-span design, these bridges required 188 prestressed I-Beams, 36 feet to 80 feet in length. These were the first pretensioned, deflected-strand I-Beams used in the Northeast, and were similar in design to the girders used on the 220 Illinois Toll Road bridges.

The longest of the York By-Pass bridges is the Cordorus Creek overpass, shown above. This bridge required 84 I-Beams, ranging from 51-foot to 80-foot spans, and 20 prestressed Box-Beams for a span over railroad tracks. All beams were manufactured with 6000 psi concrete, using 'Incor' High Early Strength Cement.

With modern highway structures like this, The Pennsylvania Highway Department gains not only the traditional advantage of concrete's low maintenance cost, but also the benefit of *low initial cost*, proved in alternate bidding.

'Incor', America's FIRST High Early Strength Cement, has played an important role in the construction of Pennsylvania's 1,000 prestressed bridges—and continues to provide the dependable high quality so essential to rapid, economical production of prestressed members.

YORK BY-PASS BRIDGES
Harrisburg-Baltimore Expressway (U. S. Route 111)

Owner:
PENNSYLVANIA DEPARTMENT OF HIGHWAYS

Engineers:
MICHAEL BAKER, JR., INC., Harrisburg, Pa.
BUCHART ENGINEERING CORP., York, Pa.

General Contractor:
LYCOMING CONSTRUCTION CO., INC.
Williamsport, Pa.

Bridge Contractor:
G. A. & F. C. WAGMAN, INC.
Dallastown, Pa.

Prestress Fabricator:
PENNSYLVANIA PRESTRESS, INC., York, Pa.

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WASHINGTON OBSERVER

- **Will Ike permit new starts?**
- **Corps doubts it can "de-ice" Seaway**
- **Airport allocations delayed**
- **Trust Fund money coming?**

● **Congress will present President Eisenhower with a public works money bill that he would like to approve in part, and reject in part.** Seldom can a President see his way to veto an appropriations bill that calls for programs he likes as well as items he doesn't like. That is why Mr. Eisenhower has repeatedly called for power to veto individual items in pieces of legislation, without invalidating the entire measure.

The $12.6-billion public works appropriations bill will be a test. It provides for new starts on Corps of Engineer and Reclamation Bureau projects that the President opposes under his "no start, budget balancing" doctrine. The Senate approved 70 new projects; the House, 44. A conference committee will decide on a total somewhere in between.

Mr. Eisenhower probably will sign, reluctantly, and then try to keep control of the purse strings by directing his subordinates to spend as little as possible. He could impound all money appropriated, as he has done before, and as President Truman did before him.

—

● **The Army doesn't think it can "de-ice" the St. Lawrence Seaway to make it navigable all year.**

The Corps of Engineers told Sen. Alexander Wiley (R., Wis.) it considers such a project "beyond the realm of possibility." Senator Wiley had proposed a study of "feasibility."

Studies are under way in Scandinavia to keep a small subarctic harbor ice-free by circulating compressed air far below the surface to agitate the ice.

But the Corps pooh-poohs the idea of using such a scheme on the St. Lawrence Seaway because of its size.

—

● **Allocations of federal aid to airports will be delayed until November.** Federal Aviation Administrator Elwood Quesada says allocations are running later than usual because of Congressional tardiness in voting the necessary authorization.

The FAA chief also is making it clear that little or none of the $63 million of federal money will be approved for terminal construction. No funds will be approved for terminals if that means not building facilities needed for safety requirements, such as a runway or taxiway.

—

● **The House Ways and Means Committee will hold public hearings starting July 22 on highway financing.** Chairman Wilbur Mills (D., Ark.) and Administration officials have been talking privately about various proposals to meet the Trust Fund deficit.

A possible solution: Increase the motor fuel tax by one cent a gallon for one year, then shift some user taxes not now earmarked for the Trust Fund from general revenues to specific highway building use.

USCOLITE PLASTIC PIPE

*Commonwealth of Virginia, Hampton Roads Sanitation District Commission Treatment Plant at Foot of 44th St., Norfolk, Va.

Uscolite pipe solves an external corrosion problem for sanitation district

The Uscolite® pipe line installed in this treatment plant* carries 150 gallons a minute of a saturated chlorine water solution (actually treated sewage water) from the chlorinator to the main sewage line entering the plant.

Prior to installation of Uscolite, pipe severely corroded externally due to the chemical content of the soil and electrolytic action. *Uscolite has eliminated the costly maintenance and constant replacement of pipe.* Uscolite pipe was installed above and below ground because it is rigid enough to resist soil pressure, yet flexible enough to follow earth contours. UscoWeld† Fittings were installed in a fourth the usual time, saving many dollars. The welds are as strong and permanent as the pipe itself. Clamp-type fittings that leak, pull off and impair flow are never needed. *Not one foot of Uscolite Pipe has ever failed in service, when used in accordance with our recommendations.*

USCOLITE ELIMINATES COSTLY PIPE INSTALLATION

Superintendent of this plant says: "The simplest 'big' piping job we ever performed. Four men laid 1000 feet of 6" pipe per day without a sweat."

• • •

When you think of plastic pipe, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial plastic products.

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Tight Money Is Pinching Housing

- **Builders are confident that construction schedules will stay as planned, but they think a housing bill would have shored up sales.**
- **Higher costs of money, labor and materials are bringing price boosts; builders had hoped 35-year mortgages would offset higher price tags.**
- **Now some lenders advise homebuilders to be cautious.**

Danger flags are flying over the private mass housing market. Borrowing costs, labor costs and materials costs are all up.

Builders, however, still remain confident that their schedules for the rest of this year will not be seriously impaired. And an ENR survey shows that a few builders have even raised their housing-start plans moderately since the first of the year.

Despite the generally expressed optimism, builders show some dismay over President Eisenhower's veto of the omnibus housing bill (see next page). Many had been banking on a provision in the bill to extend the life of government-backed mortgages from 30 to 35 years. That would have enabled them to lower monthly payments while maintaining present prices, or hold the same payment with a moderate price boost.

Another provision would have reduced required down payments on houses bought with mortgages insured by the Federal Housing Administration.

Builder confidence is based on commitments they have from lenders. Most of them have financing agreements that will allow them to operate for the next three months. Several expect to be able to move ahead for the rest of the year.

Several lenders, however, are more cautious. This comment from an Omaha mortgage banking executive reflects the feelings of the more conservative elements: "I'd be a little cautious if I were a builder. We may be approaching the point where people won't buy because of still greater financial stringency to come."

Conventional mortgage interest rates are now firm at 5½% in the money market centers such as New York City and Boston. But even in those cities, rates are crowding the 5.75% level.

Moving west and south, the conventional rate increases to between 5.75% and 6¼%. In San Francisco, 6% is common and 6¼% is not unknown. In Seattle, lenders won't stir for less than 5.75%, will move at 6%, and are increasingly doing business at 6¼%.

Government-backed mortgages, with their interest rates fixed at a maximum of 5¼%, are being discounted from two points in the Northeast up to six points on the West Coast, the South and the Southwest. Midwest areas, such as Chicago, Detroit and Cincinnati, obtain smaller discounts—three to four points. These rates hold true for FHA mortgages and it is expected the discounts on mortgages guaranteed by the Veterans Administration will be about the same. But prior to the recent boost in the allowable VA rate, such mortgages were either unobtainable or were discounted as much as nine to 11 points. A discount is the amount a builder pays a lender who takes a mortgage from his customer. For example, the buyer needs a $10,000 loan, but discounted at 5% the builder will receive only $9,500. The buyer, however, pays interest on the $10,000 and repays that amount.

Most of the discount and interest rate boosts occurred in April and many lenders report upward pressures are still being exerted.

In the same period, most builders encountered higher labor costs. Many say they will have to increase the price of their houses or reduce costs by cutting space and eliminating some features.

On Long Island, the New York City area's biggest development-housing market, new labor contracts and higher materials prices are forcing higher prices on the finished product. Builders will post boosts ranging from $200 to $800, depending on the size of the house.

The new prices are expected to force some families from the housing market, says a spokesman for the Long Island Home Builders Institute. Members of this organization, and their counterparts across the nation, say that the vetoed housing bill could have prevented the slight sales decline now anticipated. "People buy terms, not price; how much down and how much a month" is the description of today's housing market.

Extension of the mortgage term from 30 to 35 years would have prevented a higher monthly payment and left the market almost completely undisturbed in areas where price tags are on the rise.

Within the next few months, the higher costs of money may bring some further increases. Builders may be forced to absorb some of this rise. This will cut into profit. Many lenders, and some builders, say a continued hike in discount payments will probably hit the small-volume builder harder than the big-volume companies. The large builders will be able to take a lower unit profit and still come out well ahead.

The tightened money market is also resulting in some closer screening of prospective home buyers. Several builders report rejecting, for credit reasons, people who probably would have been accepted four or five months ago. "If we don't knock out the marginal buyer, the lender will," they say.

In several areas, the new VA interest rate is expected to put a slight, but temporary, upward bulge in the market. At 5¼%, it is as attractive to a lender as the FHA mortgage, also at 5¼%.

The greatest effects will probably be felt on the West Coast, the Southwest, the South and parts of the Midwest. In these areas VA mortgages at 4.75% were either unobtainable or commanded a prohibitive discount.

The Real Estate Board in Omaha says it hasn't seen any GI mortgages pass through its central sales exchange this year. "Now we may get some VA action," a spokesman predicts, "with discounts probably running about three or four points."

Los Angeles, San Francisco, Seattle, Dallas and other regions far removed from the northeastern money centers report similar reaction. Although the discounts will vary from region to re-

gion, they will remain in the range of FHA discounts.

There is some speculation, however, that revived action in VA loans eventually will bring an adverse reaction. Although VA's rate is equal to that of FHA so far as lenders are concerned, a VA loan is cheaper to the home buyer than an FHA loan. Reason: To the base interest rate of 5½%, FHA adds another 0.5% for insurance on the loan.

Thus veterans who would have settled for an FHA loan when VA's were priced out of the market, now will demand the VA mortgage. And VA mortgages will bring into the buying market those veterans who could not readily buy with an FHA mortgage because of its higher down payment schedule.

A banker in San Francisco says lenders in that area are already talking about a possible boost in the basic FHA rate to 5.75%, "although FHA will make the move with reluctance."

Should this occur, VA loans will once again be sent to the doghouse, for lenders will go where returns are highest.

Housing: Ike Says, 'Do It My Way'

For two consecutive years, Congress has tried to pass a housing bill while looking down the barrel of President Eisenhower's veto.

The threat alone was effective in killing off the multi-billion-dollar housing bill in the House of Representatives last year, after the Senate had approved the measure.

This year Congress shaved its demands—Democrats claim by as much as one half—to try to get the President to drop his guard.

But Mr. Eisenhower still wasn't satisfied. He pulled the trigger last week, vetoing the bill in stinging language: "Unnecessary . . . extravagant . . . inflationary," he said.

The veto leaves the construction industry and communities uncertain about the fate of federally backed housing and slum clearance projects. Authority was running out or already had been exhausted for contracting on urban renewal, public housing, college housing, FHA insurance guarantees.

But even if Congress fails to approve another bill later in the session, which is unlikely, there is a backlog of some $4.5 billion in various federal commitments and authorizations for housing programs of all types. And work is going forward in all these areas, as well as on some 29,000 units of public housing.

But the veto put a halt to contracting officially for any new projects. Even here, however, Housing and Home Finance Agency already is employing various stretchout devices.

Another bill is certain to be passed by Congress this year, even if it is limited to approving new insurance authority for FHA. But Congress is likely to take its time about bringing it up. Democratic leaders want time to see if the political climate will change enough to get a package through.

The President may have overplayed his hand with the veto. It came at a time when Democrats were retreating on the spending and budget issues.

But the veto, and especially the harshness of the language, angered the Democrats as probably no other Presidential action this session. It appears to have strengthened their resistance to the White House.

The housing bill was the big one for Democrats this year. In the face of the Administration's economy crusade, they had been forced to jettison practically all their big spending programs. Now, led by Senate Majority Leader Lyndon Johnson (D., Tex.), Democrats are attacking Mr. Eisenhower as negative and veto-happy.

Any package bill, however, would still be trimmed to meet some of these presidential objections:

- **On the money provisions, Democrats might agree to cut spending slightly,** and to extend it over a longer period than is now provided in the two-year bill. For instance, the $900 million to be spent on urban renewal might be trimmed some and spread out over three or four years. The same goes for the $300 million in college housing.
- **On public housing units, Democrats probably would have to settle for little, if any, new authority.**
- **Some of the financing provisions the President objected to so strongly in his veto message also are doubtful in a new bill.** These include such things as requiring the Federal National Mortgage Administration (Fannie Mae) to buy mortgages under its special assistance program at par, instead of at the going market rate; limiting fees Fannie Mae could charge when purchasing mortgages; and allowing Fannie Mae to make one-year loans in its secondary market program on the pledge of insured or guaranteed mortgages.
- **Lowering the down payments** required on medium-priced housing and raising the ceiling to $22,500 from $20,000 for FHA guarantees are items that probably would be retained in any new bill.
- **Congress wouldn't try to write in any prohibition against Fannie Mae swapping part of its mortgage portfolio for government bonds.** The House subcommittee on housing tried to do this with the present bill, but the provision was eliminated before reaching the floor.

. . . Where the Housing Programs Stand

Federal Housing Administration—This agency is accepting new college housing applications for "processing" even though new commitments aren't being made. And it is also issuing letters of "agreement to insure" on home mortgages. Its insurance authority as of now is down to $1.2 billion, but it has agreed to insure $4.5 billion worth of pending new legislation. This would probably carry the program through to next fiscal year.

Urban renewal—A total of $1.3 billion in projects has been approved since the program started in 1950. Only $36.5 million is left to authorize for new programs. However, the bulk of the construction program still is to be carried out. Congress so far has actually appropriated only $207 million for the programs. Of 686 projects authorized to date, only 26 have been completed.

Public housing—There is still somewhat more than 100,000 units on which construction still is to be started. About 29,000 units are now in construction.

College housing—A total of $925 million has been approved and all the authority has been expended; 939 projects have been earmarked for construction, more than half of them are complete or substantially complete. Construction still hasn't been started on 153. FHA is accepting applications for new projects.

College classroom, laboratory construction—This is a new proposal, calling for $62.5 million, and probably will be dropped. It could go into the separate school construction bill later.

Housing for elderly—$50 million in direct loans was proposed, but it could be sidetracked because of Mr. Eisenhower's objections to its financing.

Fannie Mae—About $2 billion is available to buy mortgages. Breaks down to $1.3 billion under secondary market operations ($2.2 billion spent since program was begun in 1954); and $675 million available under various special assistance programs (almost $2 billion has been spent).

How to Live Through a Nuclear War

If a nuclear attack comes, should we run, or dig in?

That basic argument over how to protect the nation's civilian population and key government officials flared into the open once again last week. Some say, evacuate target areas; others say, build protective fallout shelters. Here are last week's developments:

• The Office of Civil and Defense Mobilization supported the argument for shelters in a pamphlet for the general public. It describes how to build—or have built—a family fallout shelter. At the same time, OCDM continues to promote a mass evacuation policy.

• OCDM's evacuation plans came under attack from Sen. Stephen M. Young (D., Ohio). In speeches on the Senate floor and in an article in the SATURDAY EVENING POST, Senator Young lashed out at the agency for "wasting federal money" on evacuation schemes instead of concentrating on shelter construction.

• OCDM also met resistance from the House of Representatives, which denied an appropriations request for a prototype "relocation" shelter for federal officials at Denton, Tex.

• In New York, Gov. Nelson Rockefeller backed a plan calling for compulsory shelters in homes and commercial buildings.

The federal government, through OCDM, has three separate and distinct programs. They include both the "run" and "dig in" theories.

To protect federal officials—a major responsibility—OCDM wants to build a series of "relocation centers" at key spots around the country. These underground retreats—complete with records and supplies—would serve as emergency government headquarters. The House last week didn't think highly enough of the idea to vote funds for the prototype.

To protect state and local officials, OCDM's advice includes both the shelter and evacuation ideas. This program, however, is financed by both state and federal funds on a 50/50 matching basis. And the state legislatures decide how the money will be spent. OCDM has earmarked $91 million in matching funds since 1950. Some $6 million of that has gone for shelter construction work of various kinds.

To protect the general public, OCDM offers only advice and counsel to the states, which have the final responsibility in this area. New York's plan is one of the first state moves along these lines.

OCDM's new pamphlet, "The Family Fallout Shelter," recommends that family shelters provide a minimum area of 10 sq ft per person; in mass shelters, 12.5 sq ft. Walls and roof should be 8 in. thick if made of solid concrete blocks; 10 in. thick if brick. The shelters should be built in a basement. They should be of bearing-wall construction with wood roof joists supporting unmortared concrete block or brick.

Above-ground shelters, the pamphlet advises, should be of cavity-wall construction, with a 20-in. space between wythes filled with gravel or earth. The roof should be a 6-in. reinforced concrete slab covered with 20 in. of gravel or a waterproofed wood deck on heavy wood beams with 28 in. of gravel on top.

Sample bids taken last May showed a price range between $150 and $200 for materials for the family shelter, OCDM reports. Materials for a double-wall shelter would cost about $700.

The New York legislation, Governor Rockefeller says, will follow the general lines of a report from a nine-man "Special Task Force on Protection From Radioactive Fallout," which put itself squarely behind a shelter program:

"Protection from fallout must be made a cardinal principle of state policy," the report says. "Just as we would move against buildings which were fire traps or were unsafe or unsanitary, so we must modify the buildings which are now 'radiation traps' for our people."

The committee recommended a law "requiring all new construction within the state to provide shielding from fallout up to a minimum specified standard . . ." And it would require owners of all existing buildings to modify them before a specified date or to provide other fallout protection for the occupants.

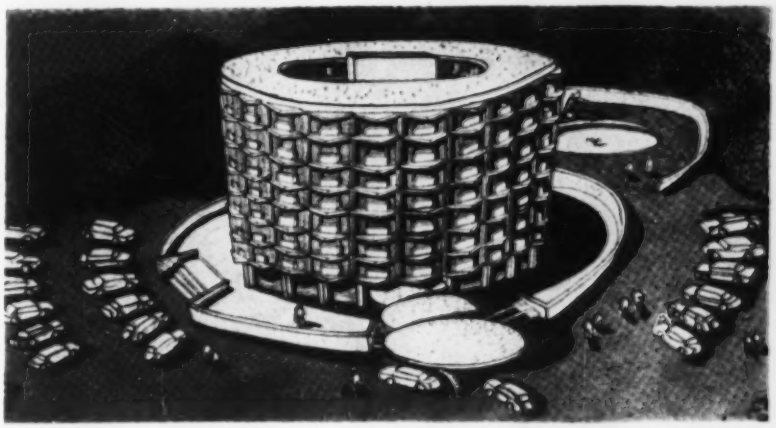
OCDM heartily endorses New York's plan as an example of the kind of state and local program the voters should support.

To most thoughtful officials, however, it is not an "either, or" question. The argument is rather over how much money, time and effort should be spent on planning evacuations, how much should be spent on building and promoting shelters.

Senator Young argues that OCDM has already spent too much for evacuation planning. But Leo A. Heogh, civil defense mobilizer, says, "It would be criminally irresponsible not to evacuate target areas" if there is any chance of receiving an advance warning of an attack.

Mr. Heogh, emphasizes, however, that evacuation plans are recommended only for direct target areas. Shelters are being urged for every area of the country to protect against radioactive fallout.

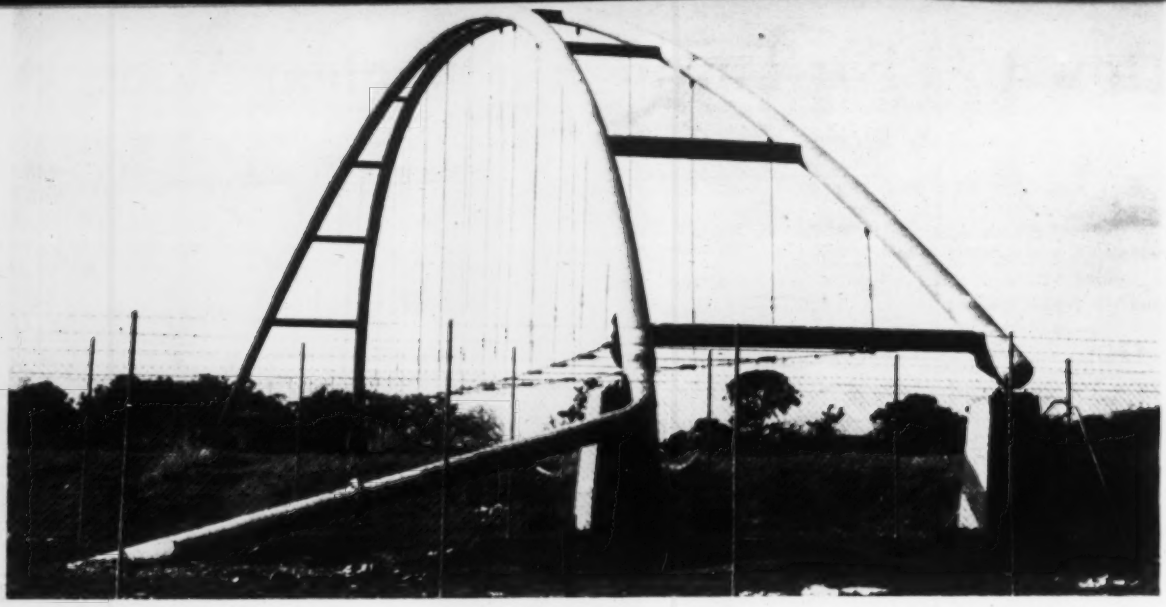
Senator Young estimates it would cost $15 billion to construct shelters for everyone in the country, and the same amount to build the extra highways necessary to evacuate just the major cities. He argues that money would be better spent on shelters.



Now, Motels-in-the-Round

All 210 rooms of La Ronde Motel near Philadelphia will have an outside view, thanks to the cylindrical shape of the nine-story structure.

Philadelphia architects Thalheimer & Weitz designed the $3.5-million motel in precast concrete. They feel it will cost no more, and perhaps less, than a motel of conventional design. Bids will be taken before the end of the summer. Completion of the project is scheduled for late next year.



Dandenong Creek Bridge, made of welded steel pipe, carries natural gas in tube at the left.

Two Australian Pipelines Serve

Instead of erecting special bridges to carry pipeline over rivers, Australian engineers are making the pipelines into bridges.

Two natural gas pipelines that cross rivers in southeast Australia are in the form of twin parabolic arches. One is a simple arch over Lane Cove River near Sydney (photo above right). The other is a tied arch, spanning Dandenong Creek southeast of Melbourne (see above).

The two pipeline bridges are similar in appearance and composition. Each bridge is made up of two arches of 18-in.-dia mild steel pipe that are braced laterally by 12-in.-dia pipe. The principal difference between them is the way in which they were erected.

For the tied arch over Dandenong Creek, the foundations were designed to carry only vertical loads. Reason: poor soil conditions and high water table at the crossing. One end of the arch is pinned. The free end is supported on rollers to accommodate movement of the structure caused by temperature changes. The expansion and contraction of the pipeline arch where it joins the main is taken up by two bellows.

The bridge has a span of 216 ft, a rise of 36 ft, and a radius of curvature of 180 ft.

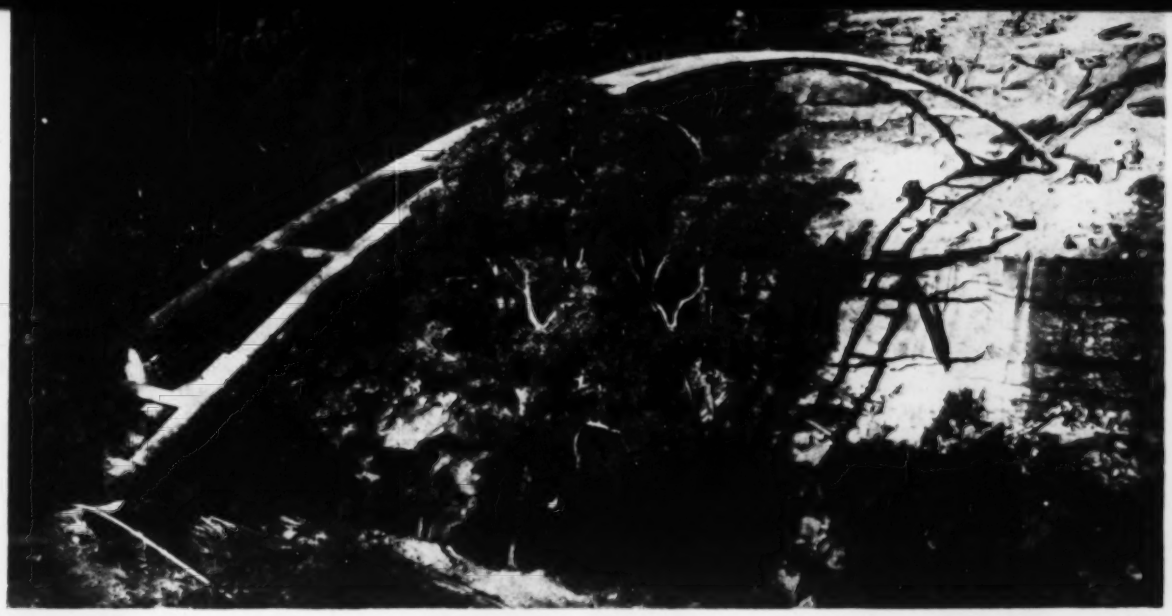
The two pipeline arcs, which are the principal parts of the 216-ft span of the Dandenong Creek, were prefabricated. They were raised into position on the piers and supported by derricks. The cross pipes tying the arches together were welded on next, working from the center of the arch. As the cross pipes were attached, cleats supporting the suspenders were welded on. The two main tie rods were attached and turnbuckles were adjusted.

Only one of the two arch pipes in the Dandenong Creek Bridge is currently used to carry natural gas; the other will be used when the city of Dandenong expands its gas needs.

The Lane Cove simple arch bridge was prefabricated in 30-ft sections and assembled at the site on the south bank. A rail track was built down to the edge of 182-ft-wide gorge and carried across it by a temporary scaffold. The bridge was mounted on a platform on the rails and moved toward the opposite side as it was put together (below).

As each section was welded into place, the structure was moved down

Lane Cove River Bridge sections were assembled on a runway . . .



Lane Cove River Bridge is a simple arch that uses both its 18-in. pipe arches to carry gas.

as Their Own Bridges

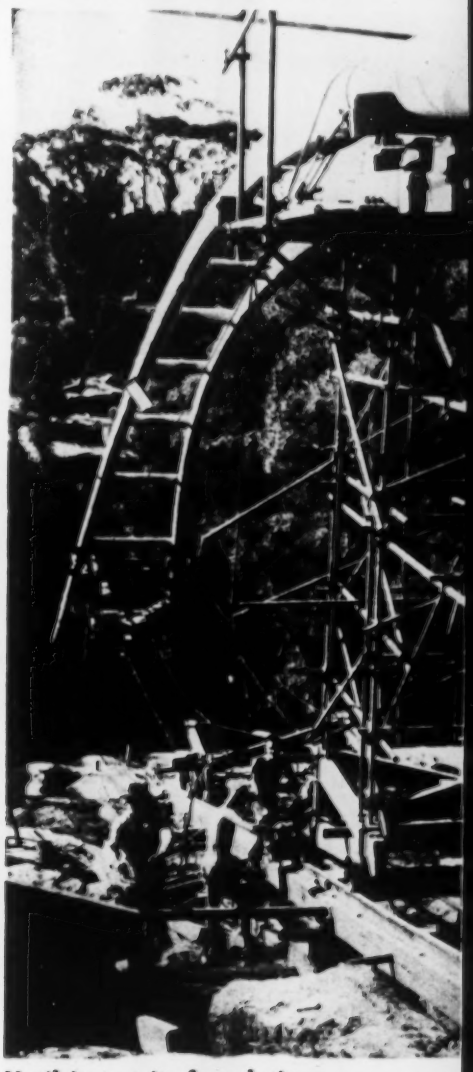
the track toward the north bank, and additional scaffold towers were erected to support it. These towers had to be changed frequently to compensate for the varying shape of the growing structure and the different levels and slopes of the tracks.

The ends of the two pipes were tied by steel cables during construction to maintain the normal arch stresses on which the design was based.

Base plates were welded to the ends of the pipeline arches. These were bolted to concrete foundations set into the banks of the gorge. A "Y" connection with a single 18-in. main at each end of the bridge enables both of the main pipes to carry natural gas from one source.

The design division of the Australian Gas Light Co., Sydney, designed the Lane Cove River pipe span.

And, as sections were welded on, it moved across the gorge . . .



Until it met its foundations.

GAO Hits Handling of Road Program

Watchdog unit criticizes consultant fees, Interstate design, ABC control and contracting procedures

Tighter controls should be exercised by the U.S. Bureau of Public Roads over the multibillion-dollar federal-aid highway program.

That's what the General Accounting Office recommends in a 103-page report to Congress on BPR operations. In its second report on BPR operations since the Highway Act of 1956 was passed, GAO criticizes bureau management of the highway program on several counts. However, it also credits the agency with trying to whip administration of the massive program into shape.

GAO reports on government agency operations, but it's up to Congress to decide what action to take. Last year's GAO recommendations produced no Congressional action, and it seems highly unlikely that Congress will act on the present report during this session. Most likely, it will be discussed next year when Congress takes its annual look at progress of the highway program.

The report was submitted to BPR for comment before it was sent to Congress.

Here are GAO's recommendations and BPR's positions:

• Congress should revise federal-aid highway legislation to bring construction of primary, secondary, and urban construction (ABC roads) under tighter BPR control. Now BPR exercises detailed control over Interstate construction, but the ABC system is left pretty much to state control, the report says.

"Uniform standards for the rest of the states' activities in the primary and secondary road systems and urban extensions" should be adopted by the bureau, GAO recommends. And it should "initiate a study of the bureau's current policies and procedures with a view toward proposing to the Congress such revisions in legislation as may be necessary" to accomplish this control.

BPR says: "The bureau previously suggested in reply to this recommendation that it would be desirable to study (this). . . . Without such a special study, the bureau is not in position to evaluate the need of legislation. . . ."

• Uniform "maximum" standards for the design of Interstate roads should be adopted. Right now, BPR has "minimum" design standards, but no "maximum" standards. "States are expected to design beyond the minimum standards, but the only ceiling on design is excessive cost and standards as high as are commensurate with conditions; both are relative, obscure, and open to many different interpretations, particularly since judgments are being exercised by many engineers at various levels of both the bureau and the states," the report says.

BPR says: "We do not agree . . . and the Administrator so testified before the Senate subcommittee" last fall. At that time Mr. Tallamy told the subcommittee that a national "maximum" design for highways was not practical (ENR Aug. 21, 1958, p. 24). If there was a maximum standard, he said, "the tendency would be to go to it, and it would be up to the Bureau of Public Roads to tell the states that you cannot have the maximum standards and you do not need them, whereas now they must demonstrate to us the need for it." The end result, he said, would be a needless increase in the cost of the new net of roadways.

• State contracting procedures should be hauled up for inspection by BPR. Although progress has been made over the last couple of years in this area, GAO reports a wide divergence of practices that need attention on the federal level. To get the widest possible competition in bidding, BPR should find out just why contractors are rejected, the report states.

BPR says: As a result of GAO's recommendations, BPR is now providing means for its field divisions to review periodically states' prequalification and bidding procedures.

• Disclosure of engineers' estimates received sharp criticism. "It is the practice of six states to publish, or disclose by other means, the engineers' project cost estimate prior to the receipt of contractors' bids on highway construction contracts. Estimates are disclosed either in total or in detail. This practice, in our opinion, may act to restrict competition and influence bidders' prices."

"We believe there is no prior assurance that engineering estimates are reliable," the report says. "The estimates are sometimes inflated and contractors could be influenced to increase their bids using an overstated estimate as a guide."

Although GAO discounts any irregularity in bidding, it also recommends that BPR attempt to get states to withhold these estimates on federal-aid work.

BPR says: "We have reviewed the possible effect on disclosure of engineers' estimates in particular situations in the past, and will continue to do so in the future. At the present time there is no indication that any improvement would result from a recommendation such as proposed in the report for nation-wide application."

• Fees paid to consultants in some states are too high, and adequate protection of public funds is not afforded. Bureau policies set forth a variety of ways that consultants' fees can be computed: a lump sum payment, cost per mile, specific rates for each class of employee, actual salaries plus a percentage of estimated construction cost.

Generally, GAO reports, consultants are paid on a stipulated percentage of awarded contract prices or estimated construction costs. In calendar years 1956 and 1957, more contracts were negotiated at 4% than at any other figure. Fees computed on this basis ranged up to $3.7 million for a single project. Since consultant fees are usually based on a percentage of costs, GAO says, "There is an incentive for consultants to prepare elaborate plans and specifications and design expensive structures to increase their fees."

GAO recommends that a reasonable maximum fee be devised.

BPR says: It has set up a joint committee of the American Association of State Highway Officials, the American Society of Civil Engineers and BPR to try to iron out some of the consultant fee problems. A new policy statement on the use of consultants for federal-aid projects is due to be put out by BPR, too. Revisions being considered include: (1) stating the qualifications of consultants to be used on federal-aid work, (2) bases of fees for consultant contracts, and (3) authorizing use of engineering consultants for construction under state supervision.

• Other areas of the federal-aid highway program that came in for GAO criticism included the manner in which right-of-way purchases are handled. In some states, the report says, state personnel in charge of right-of-way acquisition are political appointees with little professional background for the job. The report recommends that the BPR try to work out a system with states to insure that qualified personnel handle these purchases. Many states, too, get their rights-of-way by condemnation rather than through negotiation.

The matter of paying utilities for relocation costs needs adjustment, too, the GAO says, particularly for railroads.

BPR says: It backs up its present method of handling these matters. Procedures are continuously being revised. But, this must also be done within the framework of state laws and the intent of Congress.

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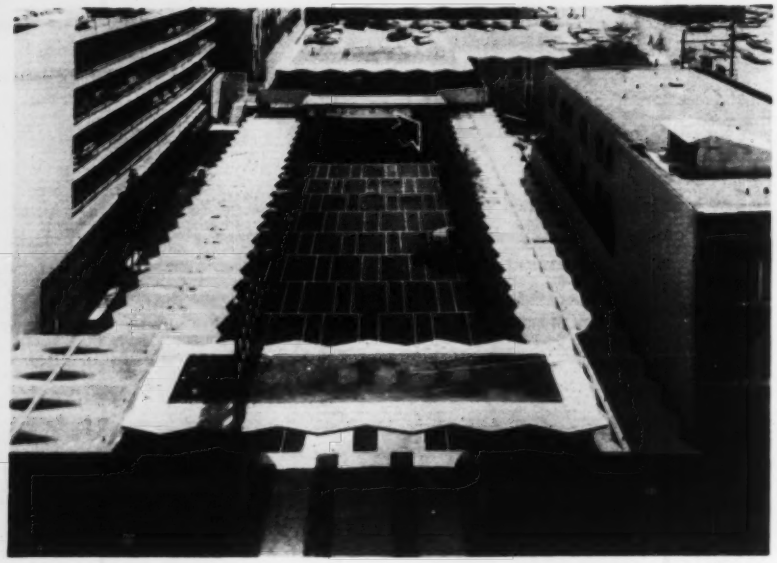

Drive-In Bank Has Pleated Roof

This modernistic structure is a new auto bank for First National Bank and Trust Co., Tulsa.

The building features drive-in windows; a two-story ramp (arrow) leading to a roof-top parking area; a folded-plate roof and a folded-plate canopy of reinforced concrete over part of the parkway leading to the bank. There is also a window for pedestrians.

The reinforced concrete structure is 187x140 ft. The parkway floor is of black concrete set off by white concrete strips; it will be illuminated at night.

Since the law does not permit Oklahoma banks to have branches, the auto bank is connected to the main bank building, a block away, by a coaxial television cable and a pneumatic-tube system. The closed circuit television allows bank officials to approve checks being cashed at the drive-in windows.

The auto bank was designed by McCune, McCune and Associates, Tulsa architects. Tulsa Rig and Reel Co. was the contractor.

Around the World . . .

• **Highway chief gets raise**—Oklahoma's next highway director will earn $20,000 a year. The state legislature's Joint Appropriations Committee has approved a boost from $15,000. The department has been without a director since C. A. Stoldt resigned January 1. Gomer Bittle, veteran department engineer, has been acting director, but indications are he will not be picked for the job.

• **Pay boost**—Wisconsin's 23,000 state civil service employees will get a 4% across-the-board pay increase. The state highway engineer's salary will rise from $14,000 to $14,500.

• **Construction egg beater**—Experimental pole-setting with a helicopter has apparently proved its worth to Puerto Rico's Water Resources Authority. The agency has bought the first helicopter ever sold especially for such work, reports Sikorsky Aircraft.

• **Foreign firm building here**—An Italian chemical company will build a $10-million plant at Neal, W. Va. The company, Montecatini Chemical Co., Milan, will open bids in August. Construction will start in the fall. The plant will produce polypropylene plastics.

• **New urban renewal boss**—David M. Walker, a veteran in the field of public land development, was appointed last week as Commissioner of Urban Renewal Administration.

• **Another big pier plan**—A $40-million redevelopment of 1¾ miles of lower Manhattan's East River waterfront was announced last week by New York City's Department of Marine & Aviation. Seven piers would be built, plus a heliport and marina not included in the cost figure. The plan may get some competition from other plans for the area.

Pentagon Fire Will Bring Redesign of Partitions

The Pentagon fire July 2 now is reported to have damaged about 20,000 sq ft of basement area. The fire destroyed expensive computer equipment, records and supplies and did about $200,000 worth of stuctural damage.

Though the fire caused some spalling and cracking of concrete beams and floor, exposing the reinforcing steel, principal damage was to partitions. These consisted of 2x4-in. wood studs, faced both sides with ½-in. plasterboard.

General Services Administration plans to use different materials in reconstruction. The outside wall will be 8-in. reinforced concrete block. Partitions will be 3⅝-in. steel studs sandwiched between ½-in. plasterboard, with a 4-ft-high wainscot of plasterboard. Fire-resistant acoustic tile will extend from the wainscot to the ceiling.

Investigators are now trying to pin down the cause of the fire. A short circuit or other defect in the electronic apparatus is the chief suspect. The basement space hit by the fire contained three electronic computers and 5,200 reels of magnetic tape.

Most of the Pentagon is protected by fire sprinklers. But none was installed in the computer room, because heat from the electronic equipment might have activated them, damaging the equipment.

$2.5-Billion Master Plan Proposed for D. C. Traffic

A $2.5-billion master plan has been devised to unsnarl Washington, D. C.'s growing commuting dilemma.

Sponsored by the Administration with a $500,000 appropriation from Congress, the study was four years in the making under the direction of the National Capital Planning Commission, and Regional Planning Council.

Spanning a 10-year construction period, the plan includes a 33-mile electric train system—about half to be subways, a 66-mile super express bus system, and a 70-mile increase in the area's already projected 259-mile freeway and parkway system.

It would be financed by bonds, transit revenues and special taxation, such as a hike in auto licenses and gasoline.

A permanent interstate agency with limited taxing power would build and operate the system and regulate transit in the whole metropolitan Washington, Maryland and Virginia area.

Congress may not like the plan on three counts: its size; the idea of taxing powers for a super-regulating body; and the possibility of deficit financing.

Congressional action, if any, probably won't come before next year.

(More news on p. 35)

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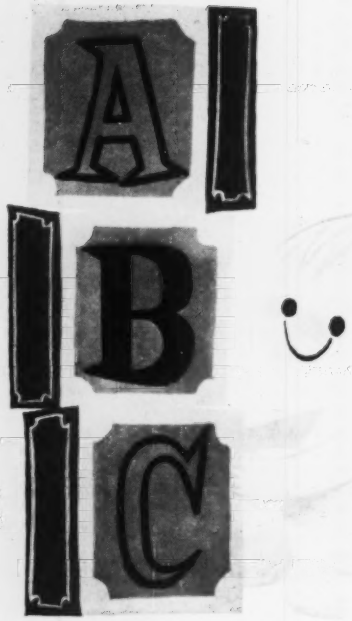

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A Mountainous Job

Georgia landmark will be converted into a park

Stone Mountain, a favorite Georgia landmark, is an impressive ½ by 2-mile-long mass of light grey granite jutting 800 ft above the rolling countryside near Atlanta.

Now the mountain will be given a complete going over to form it into part of a state Confederate Memorial Park.

The state legislature appropriated $1.5 million last year to purchase the mountain and authorized sale of $2.5 million in bonds to finance work on it. This year the legislature increased the bond issue to $5 million.

The park now has 2,500 acres. When all the construction is finished the development will cover 4,000 acres. This is what will be done:

- Restaurants and snack bars will be built, including one on the mountain top.
- A road will be cut in the mountain side for buses to reach the summit (no private cars allowed).
- An open air theatre will be cut out of solid rock.
- A cable car will run from base to summit.
- There will be a Confederate Museum on the reservation.
- "Tara," Scarlett O'Hara's fictional home, will be built in complete detail near the mountain to show just what plantation living was like in ante-bellum days.
- A 350-acre lake will be created with facilities for boating and fishing.

First stage construction will include an administration building, roads, a bus terminal, utilities and gates.

Later parts of the conversion plans call for mountain top facilities, fishing piers, gardens, a restaurant, the museum and a mountainside theatre. Robert and Co. of Atlanta are the architects and engineers.

Oklahoma Tollroad Plan Stalled; Legality Challenged

A move to revive construction of tollroads in Oklahoma is stalled until the state's attorney general gives an opinion on the legality of a financing plan now before the legislature.

Under the proposal, 97% of motor fuel taxes collected along the state's two turnpikes would be earmarked for a trust fund. The money would underwrite interest payments on bonds needed to finance two turnpikes. The House of Representatives has approved the measure and Senate approval was anticipated (ENR June 25, p. 81).

Europe's Longest Is Finished

This suspension bridge at Tancarville, near Le Havre, France, was inaugurated last week. Workers are shown here making final check on a cable of the 2,000-ft main span, which will be Europe's longest until the 3,300-ft span of Firth of Forth Bridge, just started in Scotland, is completed.

Tancarville Bridge is noteworthy for its span, hanging 168 ft over the Seine River, and also for use of prestressed concrete in its anchorages (ENR May 14, p. 41). Its towers are made of reinforced concrete, and the cables are each made up of 56 3-in. strands. The deck carries a 41-ft roadway, plus sidewalks.

Three Bridges for Coastal Waters

Three long-sought bridges in North Carolina's coastal area are included in a $35-million road program approved by the state highway commission for 1960-61.

They are: a $5-million, four-mile bridge across the Alligator River between Dare and Tyrrell counties; a $3-million to $4-million bridge crossing a mile and a half of open water at Oregon Inlet, to connect Hatteras Island with the mainland; and a new high-level bridge across the Cape Fear River at Wilmington. No estimate of the last one has been given yet, but it would be the costliest of the three.

Construction of the Oregon Inlet bridge is contingent on the U. S. Corps of Engineers stabilizing the channel, a federal project long proposed.

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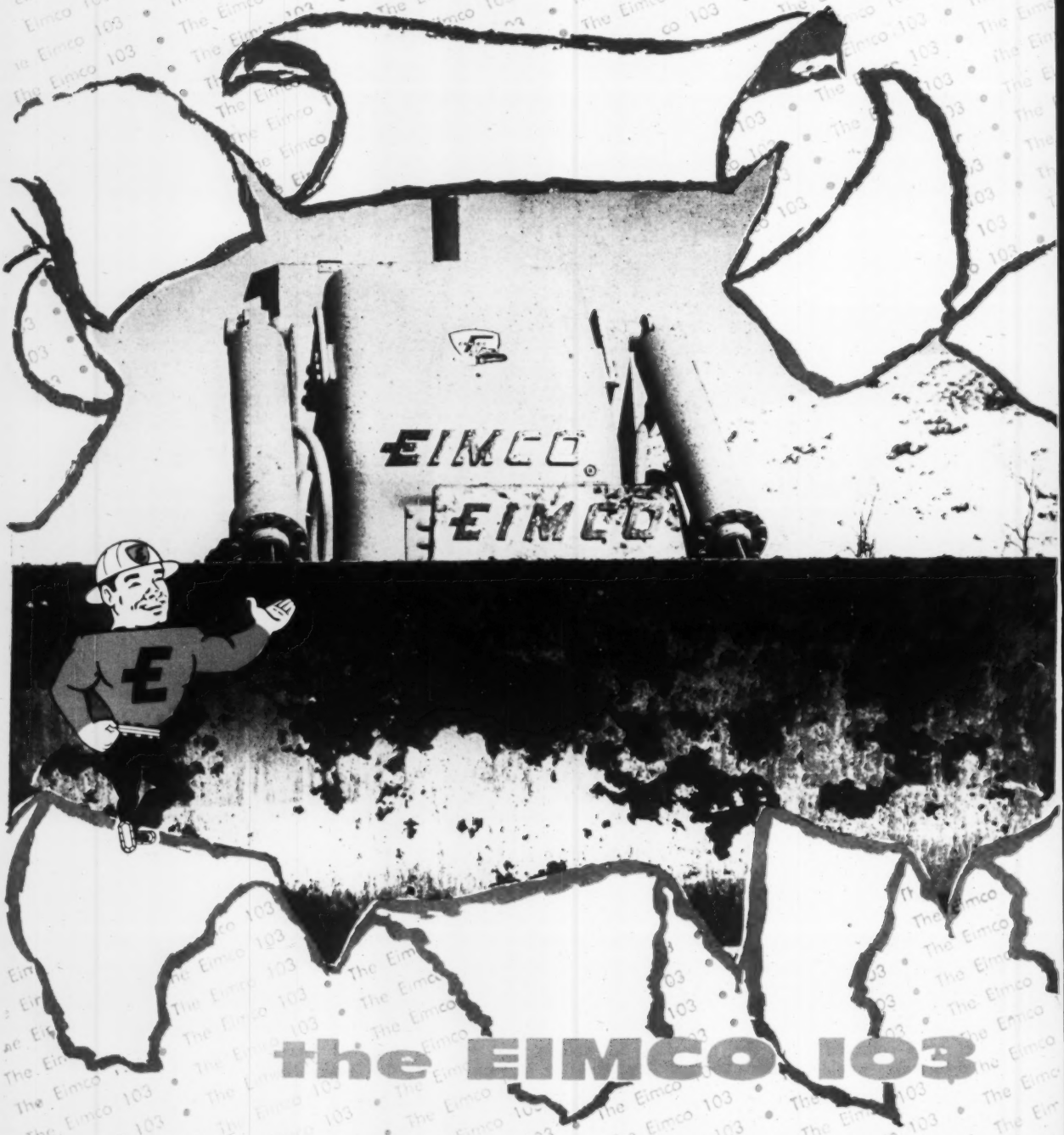

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Water-retaining capacity is the ability of a mortar to retain its moisture, and hence its plasticity, when spread out on porous brick.

High water-retaining capacity is of *great importance* in mortar. If the mortar does not have high water-retaining capacity, it is too quickly sucked dry by the brick: the mortar stiffens too soon, the brick cannot be properly bedded, and a good bond cannot be obtained.

Brixment mortar has high water-retaining capacity. It strongly resists the sucking action of the brick. Brixment mortar therefore requires less tempering, stays smooth and plastic longer when spread out on the wall. *This permits a more thorough bedding of the brick, and a more complete contact between the brick and the mortar.* The result is a better bond, and hence a stronger and more water-tight wall.

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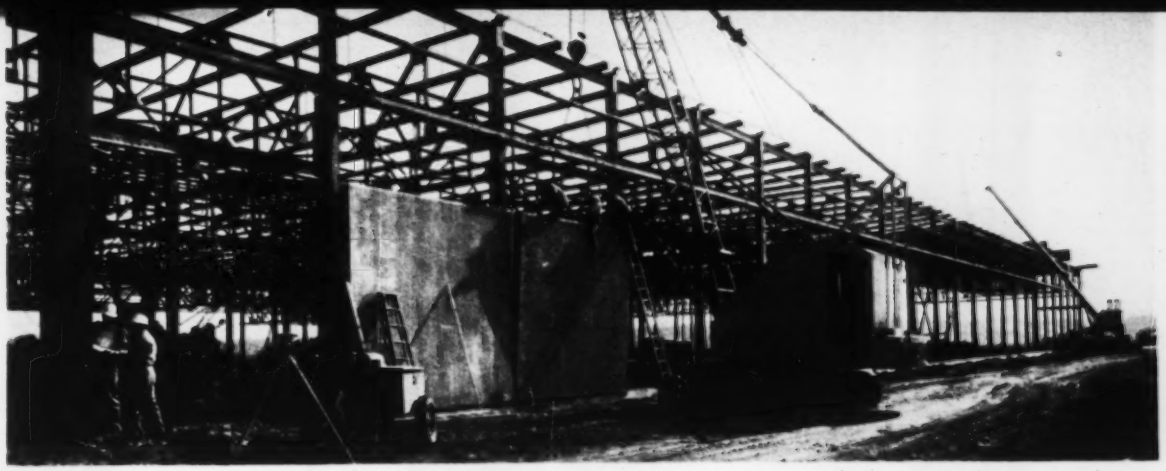

Precast Concrete Wall Panels . . .

Were Formed at the Job Site . . .

. . . For Giant St. Louis Auto Plant

Shiny new Plymouths will soon be rolling off the line at one of the largest automobile assembly plants in the country—Chrysler Corp.'s St. Louis complex, which will be completed in September.

The main assembly building is nearly 1,500 ft long, 720 ft wide and 54 ft high, with 1.4 million sq ft of floor space. About 10,000 tons of structural steel and 60,000 cu yd of concrete were used in construction of the sprawling structure.

Six independent smaller buildings also stand on the 235-acre site. They are an administration building, powerhouse, paint-mix building, a new car check-out building and two guard houses (one of them is combined with plant protection quarters).

(Turn the page)

HOW TO RUB or GRIND CONCRETE

Today, more and more builders specify a fine finish for concrete walls and ceilings. Because of this new requirement, and of the time and expense involved for hand finishing large areas, Stow Manufacturing Company has developed two, easily portable flexible shaft grinders for finishing concrete. These grinders are electrically powered.

Two methods are used to smooth off hardened concrete: wet rubbing and dry grinding. Wet rubbing—required for smoothing green concrete to a plaster-like finish. Use slow speed grinding wheel or disc. Apply water while grinding. Wet concrete can also be painted on with a brush, then smoothed into holes with the grinding wheel. Dry Grinding—use a high speed grinding wheel or abrasive disc to smooth dry concrete.

Either of Stow's portable electric grinders, the ½ HP model G40-C or the ¾ HP model JT-50, can be used for wet or dry grinding. Both models are available with open or totally enclosed motors, and are equipped with 8 or 12-ft. flexible shafts. Angle heads with different speed ratios can be selected. Write for STOW's pamphlet, Grinding Concrete, for complete information on proper speeds, grinding discs and wheels for both wet and dry concrete finishing. Stow Manufacturing Co., Binghamton, N. Y., also makes a complete line of concrete vibrators, rotary trowels, and screeds.

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. . . Five-ton, precast panels were cast at the site

• **The structure**—The main assembly building is a one-story rectangular structure. It includes a mezzanine 495 ft wide by 675 ft long. Fan and transformer rooms are located on the roof.

The structural steel frame is enclosed with exterior walls composed of three long horizontal bands running the full length of the building. Precast concrete panels run from grade to window sill. They are 13 ft 6 in. high and 15 ft long.

Above them is a continuous, horizontal band of aluminum window sash, and above that, aluminum siding.

About every 225 ft, a strip of sash 15 ft wide with an emergency door in the center is extended down to the floor. This safety feature also gives a desirable break in the monotony of the assembly building's long, continuous walls.

To obtain maximum efficiency in producing precast panels for the walls, casting beds with space for fabricating ten concrete panels per day on a five-day continuous production schedule were set up at the job site. A total of 350 such panels, weighing about 10,000 lb apiece, were produced.

• **Fabricating the panels**—Five 170-ft long casting beds were set up at one end of the property, near a concrete batching plant.

The casting beds were built on supports 18 in. above grade. Timbers 4 in. by 6 in. were laid on the supports 24 in. c-c. A ¾-in. plywood deck was nailed on top. Individual boxed forms, 13 ft 2½ in. by 14 ft 11¼ in., were constructed on this deck. Two lifting bolts were inserted in the forms.

Air entrained, 3,500-psi concrete was used for the panels.

After curing, the panels were hoisted by crane to a flatbed truck and delivered to the erection site, one at a time. There they were hoisted off the truck by crane and lowered into place. The panels were set on a concrete wall, shimmed to proper level and height, and then grouted.

• **Providing ventilation**—Many different types of ventilating facilities were needed.

The roof over the mezzanine of the assembly building has several builtup enclosures for this purpose. The largest unit is 135 ft long, 90 ft wide and 16 ft high; other similar units are of smaller size but equal height. They are equipped with large fans and fresh-air filtering units to supply outside heated, fresh filtered air to car-spraying enclosures on the mezzanine. These enclosures have concrete floors, metal sidewalls and metal-deck roofs.

The roof directly over the first floor of the assembly building supports four fan-and-transformer rooms. Each is 180 ft long, 45 ft wide and 17 ft 6 in. high. An overhanging canopy runs the full length of a side of the rooms. It consists partly of screened louvers that prevent snow or rain from being drawn into the main fresh-air intake fan enclosures.

Four fans inside each room are individually controlled by automatic dampers and louvers. The air can be regulated to draw outside fresh air through the overhanging canopy, or through a grill in the fan room floor, or through both. Air temperature can be controlled by regulating the amount of steam supplied to the finned heating coils which are set across the intake-air passage.

Openings, 4 ft square, are provided in every 45x45-ft bay of the assembly building roof. Mounted over these openings is a sheet-metal vent, or a combination summer exhaust fan combined with a smoke vent. The vents have two hinged doors held closed with a fusible tie chain. In case of fire the fusible link melts and a spring and levers force the hinged doors open, allowing fumes to escape.

Also spotted over these roof openings is the exhaust-fan-vent combination for summer exhaust.

All roof openings are similar in design, making the smoke-vent units or summer fan exhaust units interchangeable for relocation to suit summer exhaust conditions within the building.

• **Other buildings**—The administration building, although dwarfed by the nearby assembly plant, is actually larger than most St. Louis office buildings. The ground floor covers 38,604 sq ft, while the second floor has an area of 23,620 sq ft.

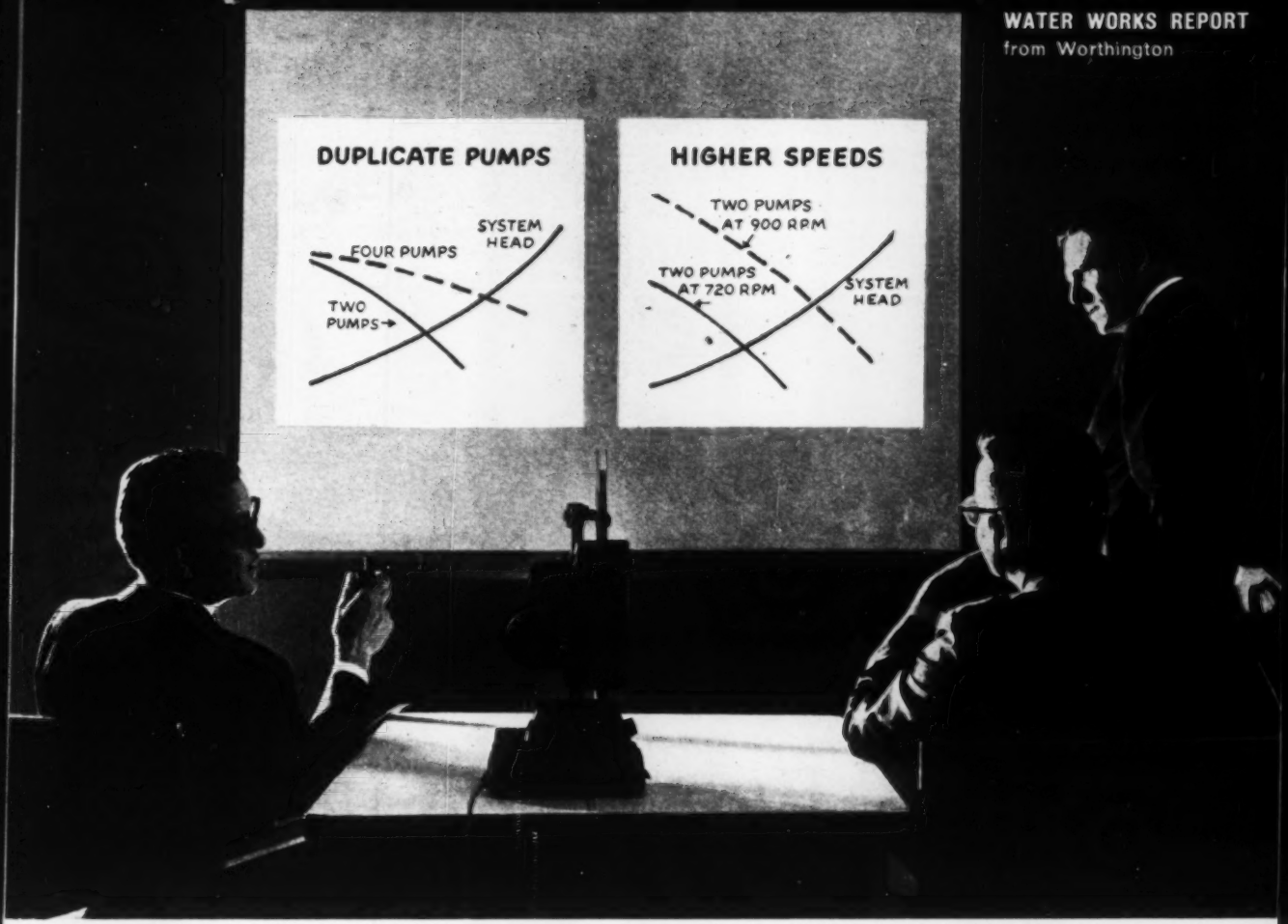
The powerhouse and the paint-mix building cover 45,368 sq ft of ground. The remaining three buildings are smaller and are located in areas adjoining the main parking lots.

A spherical tank, 160 ft high, with a capacity of 400,000 gal and two additional ground suction water tanks, are included in the fire protection system.

The 46-acre parking lot has a capacity of more than 6,000 cars. Between 3,500 and 4,000 persons will work at the plant.

Albert Kahn, Associated Architects & Engineers, Detroit, designed the assembly plant. H. D. Tousley Co. was general contractor.

The administration building was designed by Sverdrup & Parcel, St. Louis. Fruin-Colnon Contracting Co., St. Louis, was general contractor.



Two ways of taking care of future demands for increased capacity are shown here. The chart on the left indicates the performance of 4 pumps operating in parallel. The chart on the right indicates the same conditions obtained with the use of 2 pumps operating at higher speeds.

DUPLICATE PUMPS OR HIGHER SPEEDS?

A discussion of the economics of multi-speed pumps for water works

Today, most engineers plan for expansion by providing space for duplicate pumps, or pumps that will operate in parallel giving increased capacity as water demand increases.

Another way of taking care of increased capacity is through the use of higher speeds. By providing for multi-speed operation in the future, it may be possible to save thousands of dollars. Spare parts, as well as maintenance costs, can also be reduced.

The charts above show how this can be done. Suppose your water works now uses two 60 hp centrifugal pumps. Sometime in the future you plan to increase capacity by one-third by adding two more pumps which will operate in parallel. The total cost of the four pumps and motors installed would be approximately $26,000.

This same increase in capacity, in some instances, can be accomplished by multi-speed pumping. If you initially made the proper provisions, you could later increase the speed of the two pumps from 720 rpm to 900 rpm. This would give you the necessary capacity increase of 33⅓%. And the total cost would be only $21,000, a saving of $5,000 or approximately 20%.*

It's not necessary to limit your thinking to two-speed operation. Possibly the most economic proposal for your system would be three or four-speed operation. All public water-supply systems are different and pumping equipment is affected by different capacities, suction conditions, and static and friction heads. Therefore, all factors must be known before deciding on the proper approach. This sort of planning, however, combined with the use of multi-speed pumping when appropriate, can save you large amounts of money.

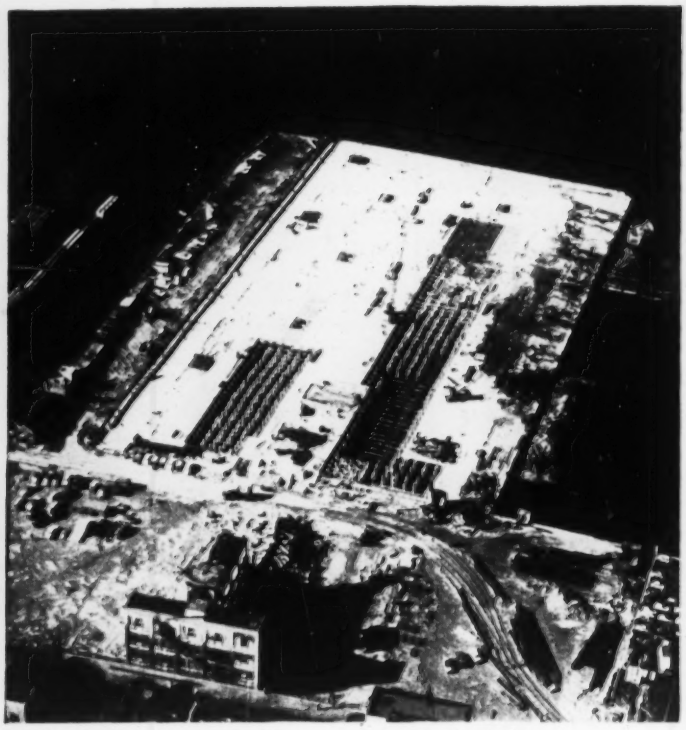
Ask your consulting engineer about the merits of multi-speed pumping. He'll explain to you its many advantages. And for unbiased equipment recommendations, get in touch with Worthington. Worthington makes all types of pumps and drives and a complete line of engines, compressors, and auxiliary equipment.

For a reprint of an engineering discussion of multi-speed pumping for water works, write to Worthington Corp., Section 105-4, Harrison, N. J. In Canada: Worthington (Canada) Ltd., Brantford, Ont.

*Cost figures are estimated and conservative. No cost has been added for additional space required by the extra pumps.

WORTHINGTON

Lots of low-capacity timber piles . . .



High-production-type, flat, simple deck slab . . .

How Modern Piers Save Money

Economy in construction and economy in operation—that's what the Port of New York Authority seeks in its design of 2,650,000 sq ft of new piers going in along two miles of Brooklyn waterfront. The project is being carried out under an $85-million program to replace 25 obsolete piers with 10 new ones (ENR June 6, 1957, p. 66).

Here are some of the ways these economies are being achieved:

1. Low-capacity timber piles

A large number of relatively low-capacity timber friction piles is used in a pier, instead of a small number of high-capacity steel or concrete point-bearing piles.

This means savings because the piles themselves are cheaper, and because, since they are closely spaced, a flat slab can be cast for the deck. The deck thus becomes a high-production type of construction that is faster and cheaper than a beam-and-girder-supported floor.

Pier 2—already in operation—illustrates the savings possible. Winning low bid was for timber piles (plus some steel-pipe piles to span a subway) and flat slab. Bid was $2.6 million.

The low all-pipe-pile bid with a precast, prestressed concrete deck was $3.4 million; plus $153,000 for cathodic protection. (Demolition costs for the old piers on the site are included in both figures.)

A typical example of Port Authority pier construction is Pier 3, which was dedicated this month.

The pier is 350 ft wide and 650 ft long. It contains 3,340 pressure-creosoted timber piles spaced on 9-ft-7-in. by 8-ft centers.

The piles average 65 ft long and extend through 35 ft of water. They are driven through an overburden of silt into a 15-ft-thick layer of sand that overlies a layer of clay. None of the piles touches the underlying rock. The piles are driven to a design capacity of 25 tons.

After the piles are in place, their tops are cut off 2 ft above the mid-tide elevation. Precast concrete cylinders are placed over the piles to extend them to deck height.

Main reason for this composite construction is to fireproof completely below decks.

The concrete extensions are standard 20-in. ID concrete pipe. They run between 9 and 10 ft long. After they are on the piles, the cylinders are filled with concrete. An asbestos pad at the lower end keeps the concrete from running out.

Four reinforcing bars, bent at a 90-deg angle, extend from the top of each cylinder. These tie into the deck slab.

2. Flat, simple deck slab

With relatively little space to span between piles, there is no need for floor slab framing.

Forms for the slab are laid up so that 4 in. of the concrete cylinder will be incorporated in the deck. The forming is either reusable plywood sheets or corrugated steel sheets that are left in place.

The deck can now be cast as a high-production flat slab, since there are no stringers or pile caps to be accommodated.

A 12-in. course of portland cement concrete with bar reinforcing is used. The surface is hardened and sealed.

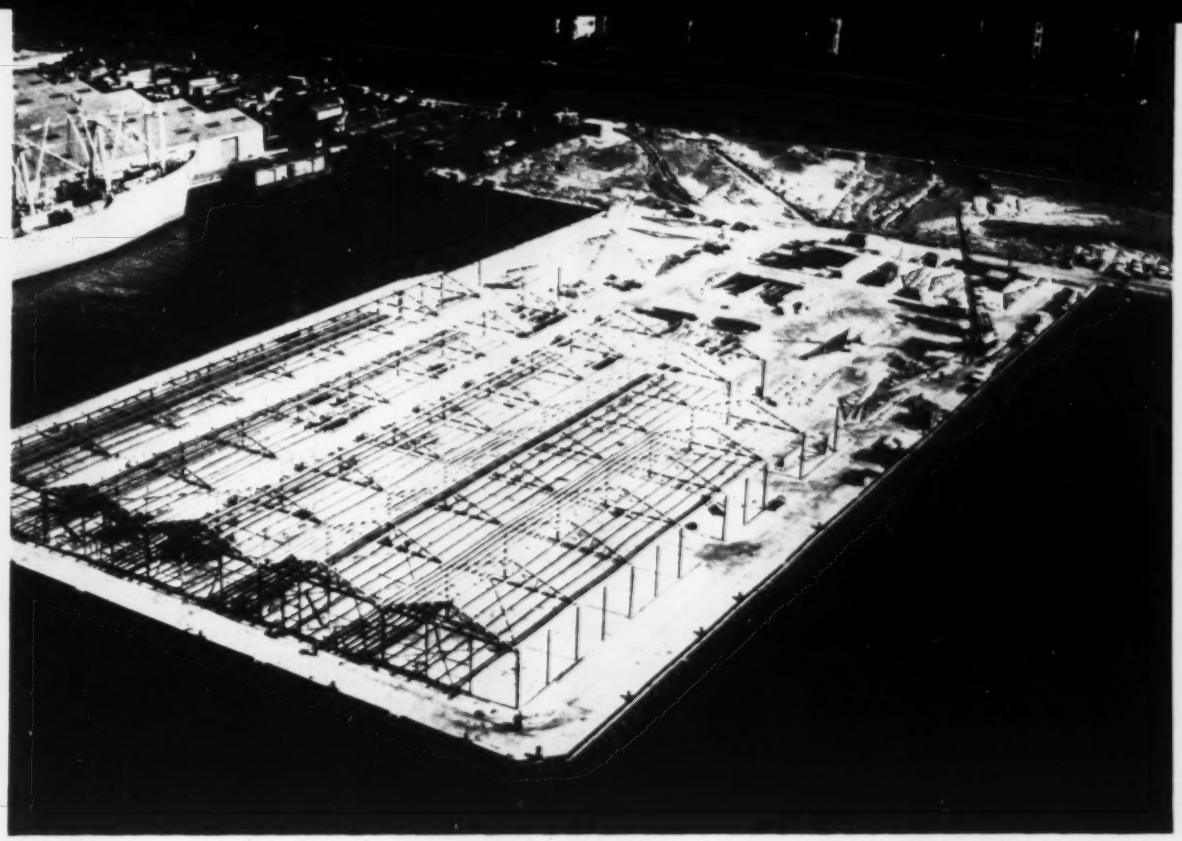
3. Light superstructure

The ten piers will have a total of 2,174,000 sq ft of covered space.

Pier 3 has 177,460 sq ft of covered space provided by a shed 290 ft wide and 612 ft long.

Light steel framing is used. Five trusses, each spanning 58 ft, cross the width of the shed.

Roof and sides are corrugated aluminum sheets for minimum maintenance and maximum interior coolness. The roof is formed with five ridges

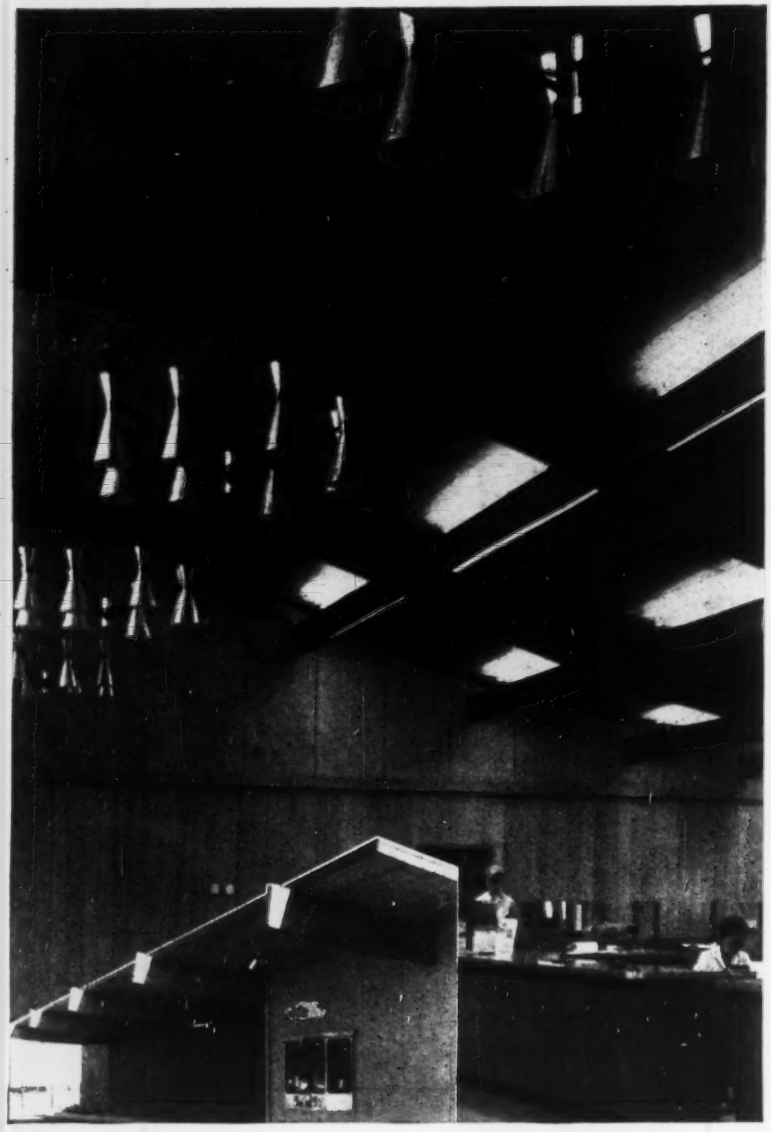


Light steel superstructure set back to provide wide aprons . . .

. . . And big, paved upland areas for trucks save money on Brooklyn piers.

First National Bank, Coburg Road branch, Eugene, Oregon. Architects: Balzhiser, Seder & Rhodes, Eugene, Oregon. Contractor: John M. Steinmuller, Jr., Eugene, Oregon.

Space provided: main banking room, safe deposit vault, employees' lounge, men's and women's rooms, furnace room, storage area. *Structural framing:* double curved beams spaced at 15'. *Exterior walls:* rough cut siding, stucco, stone. *Interior walls:* wood paneling, plaster, metal wall tile. *Heating:* forced warm air duct system. *Ventilating:* refrigerant forced air system. *Lighting:* fluorescent and incandescent. *Floors:* asphalt tile over concrete slab. *Roof:* built-up felt and tar with crushed Haydite over striated Tim-Deck. *Area:* 3,468 square feet. *Cost per square foot* including 24,600 square feet of paved parking area: $14.84.



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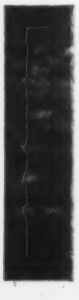

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for more efficient natural lighting and to improve ventilation. About 5% of the roof area is made up of translucent plastic panels that "daylight" the interior.

4. Wide aprons

The shed is set back from the pier edges to leave 30-ft-wide aprons on the three water sides.

These aprons allow increased efficiency in loading and unloading ships. Cargo-handling equipment has plenty of space in which to work and trucks can make time-saving turns on the apron itself.

The setback also protects the shed from any damage by swinging ship booms.

5. Big, paved upland areas

A total of 42.3 acres of paved upland area is planned for the piers.

The space is used for outdoor storage of some cargo, pallets and dunnage lumber.

But its biggest advantage is that it gets the trucks off the surrounding traffic-laden narrow streets—a boon to trucker and ship line.

Pier 3's upland area measures 160,000 sq ft. It is paved with a 4-in. subbase of stone screenings, a 3-in. base of penetrated stone and a 2-in. wearing course of asphaltic concrete.

A truck platform at the inshore face of the pier has space for 16 trucks. Another 30 trucks can be handled right within the shed.

6. Other features

Fendering—A row of piles around the pier connected by two sets of waler is the fendering system. Rubber cylinders that compress upon impact are set in the space between piles and deck for further cushioning.

Dry-pipe sprinkler—The piers are fitted with a dry-pipe sprinkler system. With no water in the pipes until needed, a lack of heat does not affect the system in winter. Three pumping stations will be built to double the city water pressure for the 10 piers.

Four piers have been finished and leased by PNYA.

Annual rentals range from $200,000 to $220,000 per ship berth.

It's estimated that the 10 piers will save users over $5 million a year in reduced operating costs because of the modern, efficient cargo-handling facilities.

For PNYA, A. Lyle King is director of marine terminals; Duncan Reid is deputy director. Guy Tozzoli is manager of the marine planning and construction division; John M. Kyle is chief engineer and John S. Wilson is engineer of design for marine terminals.

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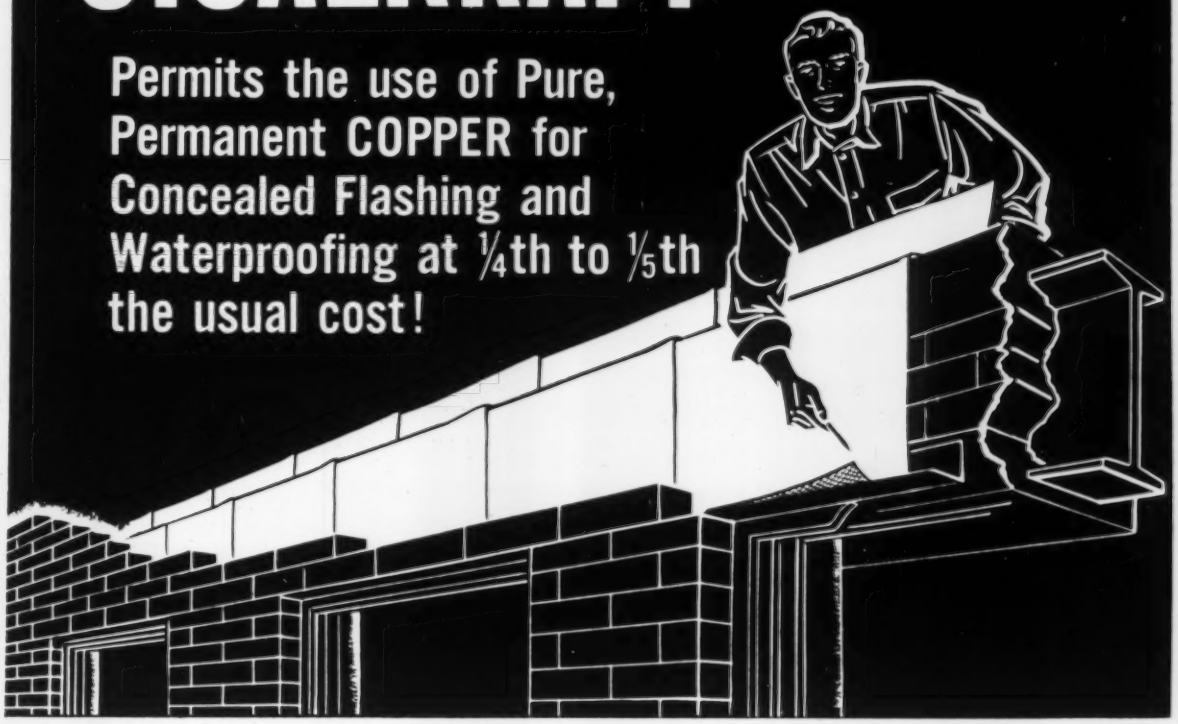

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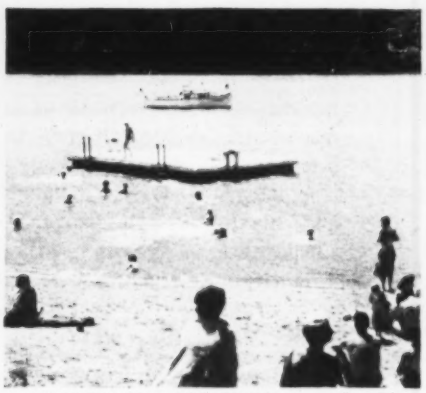

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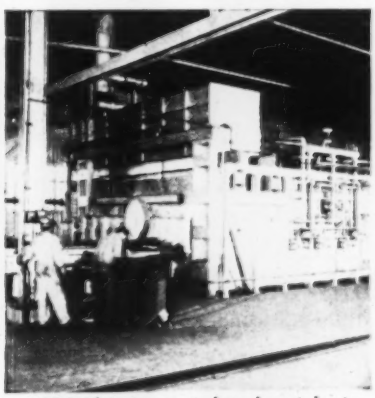

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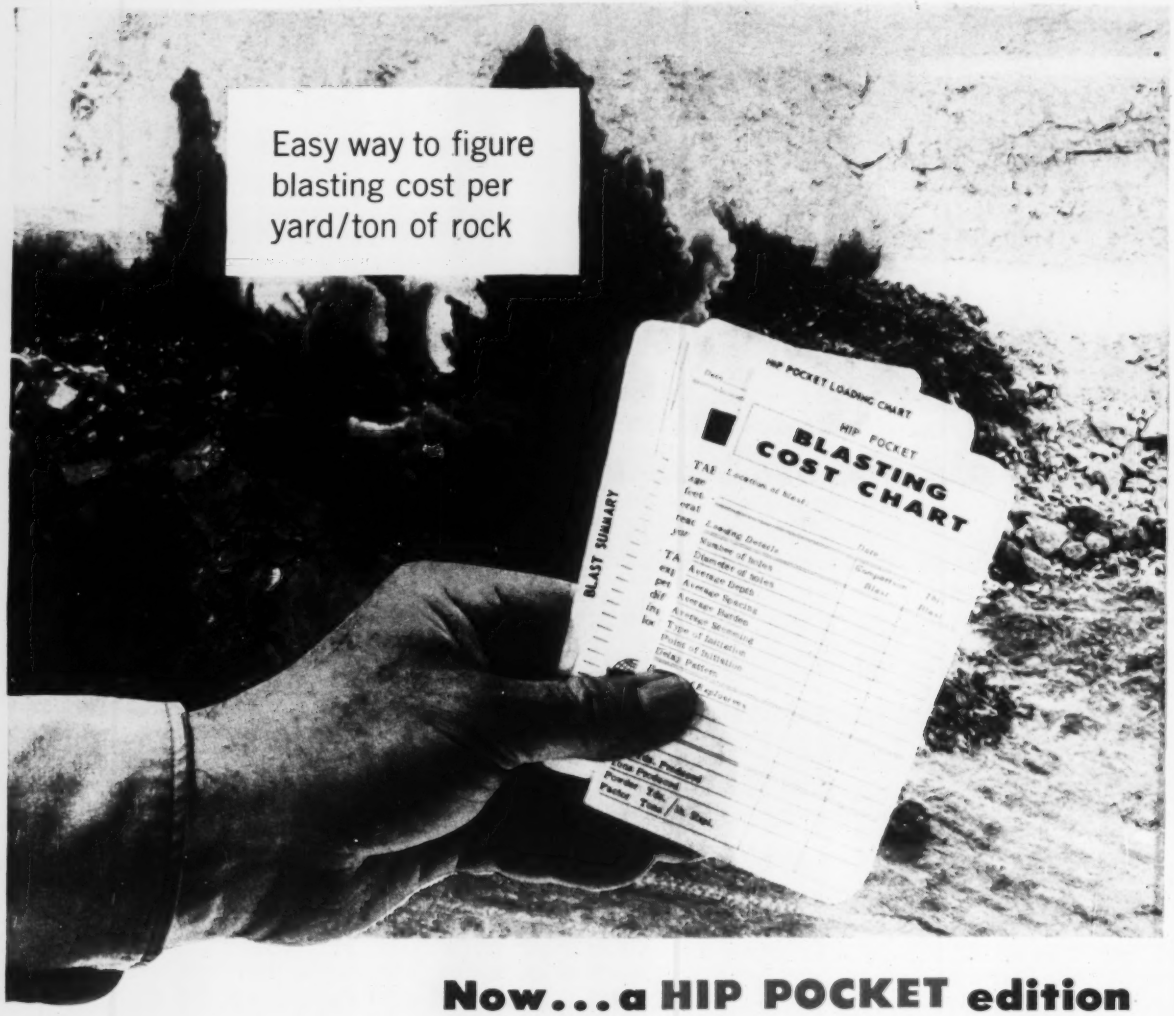
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Transition sections of Glen Canyon Dam power tunnels rule out center posts, so . . .

Tunnel Supports Span 113 Feet

Transition sections of Glen Canyon Dam's spillway tunnels have the widest tunnel opening ever spanned by support steel—113 ft in some spots. Used for the job are the heaviest steel structural sections ever bent to support a run of tunnel.

From the rectangular, arched-roof portal, the transition sections change continuously in size and shape to attain the smaller, circular cross-section of the tunnel. In addition, the elevations of the roof, spring and flow lines continuously change throughout the length of the transition section, and the elevation of each line changes at a different rate. None are simple curves; all three are exponential curves and each has a different formula.

The result is one of the most difficult steel tunnel support jobs even undertaken.

The two spillways are designed for a maximum total discharge of 276,000 cfs. Each consists of an open cut leading off the canyon wall connected to a sloping tunnel of circular cross section by a transition section. Each portal is over 60 ft high from floor of excavation to the bottom of the arch top rib. And width is 113 ft between the insides of opposite rib grillages.

There is some 120 ft of rock—Jurassic Navajo sandstone—above the ribs at the portals. At the lower end of the transition sections, tunnel size has decreased to a height on the slope of 51½ ft and a width between grillage of over 63 ft —still a tunnel of impressive size.

• **No center posts**—Although the concrete lining will include a center wall dividing the initial few feet of each transition section into two tubes, it was found impractical to support the roof with two arches of ribs and a line of center posts. Used instead are heavy rib sections capable of supporting the 106-ft opening (after lining) in a single span. Resulting sections are 14 WF 167 members decreasing to 12 WF 72 members at the lower end.

Strictly speaking, these are not the heaviest sections ever used for tunnel support. Several years ago the rib fabricator, Commercial Shearing & Stamping Co., bent a few ribs from a heavier structural section for use at two intersections of large tunnels. However, the Glen Canyon transition ribs are the heaviest sections ever bent in quantity for a run of tunnel. They were bent cold by a special press method developed by Commercial. The ribs were made in segments and bolted together in the field to form complete ribs. The number of segments per rib varies from six to eight.

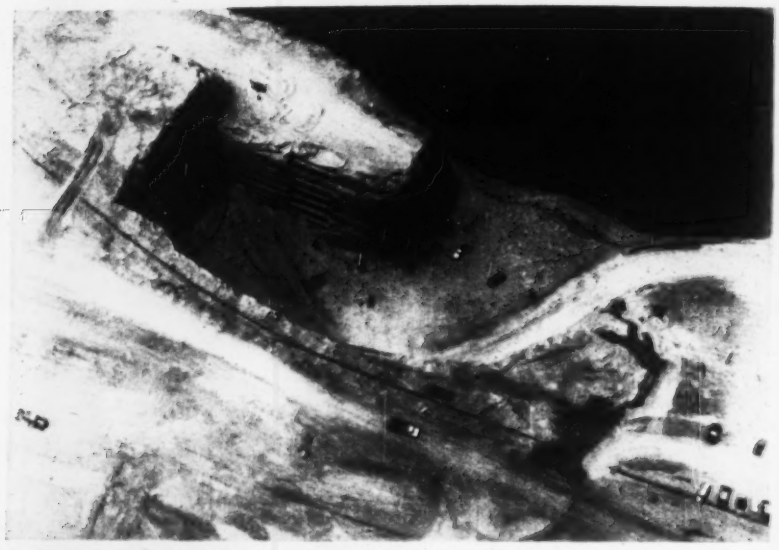
• **Ribs grouped**—The fabricator designed the support ribs in groups of two to four, with all ribs in each group parallel. With a curving roof profile, this means only one rib in each group is in a plane exactly normal to the roof line. However, the groups were made as small as necessary to insure that each rib would be in a satisfactory approximation of its ideal plane.

The ribs were grouped for two reasons:

First, it simplified design, fabrication and erection by making it possible to utilize identical rib segments in several different ribs. Had all ribs been designed to be normal to the roof line, each individual rib segment would differ from every other one.

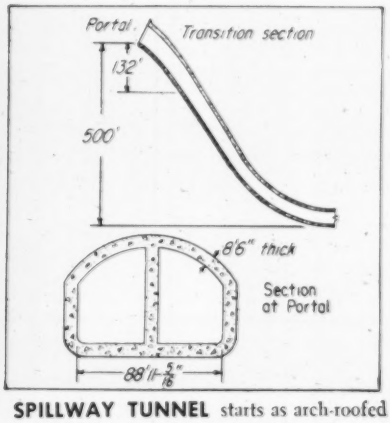
Second, the grouping was planned so that longitudinal thrust resulting from

BLASTS are made with millisecond delays for better fragmentation.



SPILLWAY FOREBAY curves into canyon wall above Colorado River (dark area, upper right). Stepped area marks location of spillway gates.

ABOVE THE PORTAL, the sandstone face of the spillway forebay is held by roof bolts. Similar bolts are used in the circular section of the spillway tunnel.



SPILLWAY TUNNEL starts as arch-roofed rectangle, changes to circular shape.

the rapidly decreasing elevation would not be transmitted from rib course to rib course throughout the entire transition section. This would have built up an enormous accumulation of load at the lower ribs. Instead, the ribs in each group are connected by longitudinal thrust members, which serve as spacers, thrust members, and collar braces. These braces are 8 WF 31 sections, which are themselves heavier than the steel support ribs in many good-sized tunnels.

There are no longitudinal members to transmit thrust between groups of rib courses. Thus, longitudinal thrust does not accumulate continuously from top to bottom of the steel transition sections.

Each group is instead blocked and tied securely to solid rock by 8 WF 31 skirt struts. Thus, the accumulated longitudinal thrust of members of the group is borne by the rock and not transmitted to the following rib courses.

Foot plates are welded to the end segments of each rib and bolted to steel grillages, which rest on poured concrete foundations. The grillages spread the load out over a greater area than could be obtained with foot plates of reasonable size. This keeps loading per unit area within the capacity of sandstone.

• **Excavation** – Glory-hole excavation methods are used on the sloping part of the spillway bores. The slope is 55 deg from horizontal. Thus, although vertical drop is only about 450 ft, the sloping part of the tunnels are more than 500 ft in length along the center line.

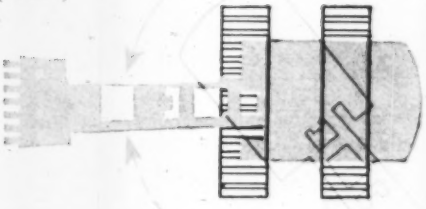
While the portal excavations were under way, 9x8-ft shafts were raised from the lower tunnel level to serve as glory holes for excavating the full tunnel sections.

Drills with powered tracks put down some 350 holes for each round. They work on a horizontal face that has a 66x54-ft elliptical shape. Blasting is done with millisecond delays for better fragmentation. A small bulldozer shoves the blasted rock into the glory hole, and the material falls down the steep slope into hoppers at the bottom. Trucks remove it.

Once the transition section was passed, heavy steel ribs were no longer necessary. The regular tunnel section is held with 8-ft roof bolts. The glory-hole tunnel also stood with no support due to its small size.

Later the spillway tunnel will be lined with concrete. Thickness will vary from 2¼ to 8½ ft.

General contractor for the Glen Canyon Dam project is Merritt-Chapman & Scott Corp. Subcontractor for the spillway tunnels is Frazier-Davis Construction Co. Subcontractor to Frazier-Davis for the right spillway tunnel is Northwood, Inc. The dam is a Bureau of Reclamation project.



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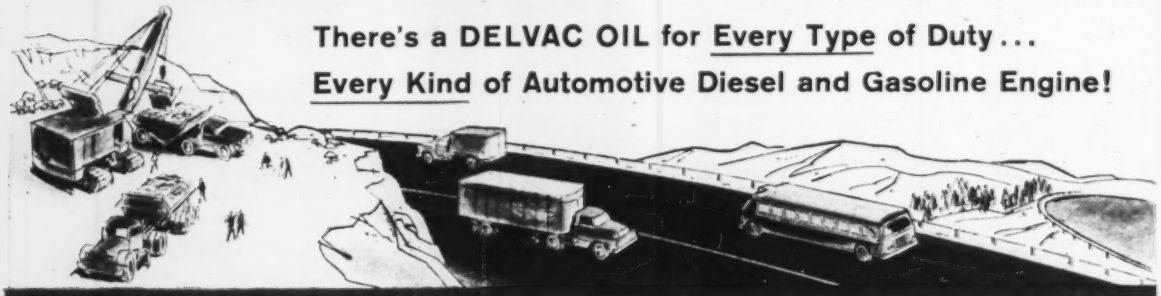

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How Russians Drive Piles by Vibration

The vibro-method of pile and sheetpile driving, discussed last month by the Soviet delegation of soil and foundation specialists at Princeton, M.I.T., and the Universities of Illinois and California, has aroused considerable interest. The numerous inquiries that have come to the writer, who was one of those who strongly urged our Soviet guests to include the topic in the program of the seminars in this country, suggest that a brief clarification of the present technical and legal status as well as the background of pile driving by vibration would be helpful.

• **Principle not new**—The idea of using eccentric weights mounted on shafts rotating in opposite directions for the purpose of inducing forced oscillations of foundation elements is far from new. Machinery of this type was used in the early 1930's both in Germany and the Soviet Union.

Also, the use of such vibratory machinery for pile driving was described in the Soviet Union almost a quarter century ago (see references 1 and 5) by Dr. D. D. Barkan, who has been internationally known as an expert on soil foundation vibration problems since his 1936 paper on the subject at the 1st International Conference on Soil Mechanics and Foundation Engineering at M.I.T. (reference 2).

Dr. Barkan also had a paper at the 4th International Conference in London in 1957 (reference 5), which was favorably commented on by the general reporter, Philip C. Rutledge of New York (reference 6). And finally he and his colleagues have written on the theory and practice of vibratory driving in many Russian language publications during the past decade.

• **Vibrators are the key**—It is not, however, the idea of vibratory pile driving that is important, but rather the development, by continuous experimentation, of several rugged types of vibrators, each best suited for sinking a different type of piling under varied field conditions. So far, only the Soviet engineers have provided evidence of having achieved this.

In this connection it might be noted that W. P. Kinneman of Raymond International, Inc., stated at the Princeton seminar that a vibrator his company had developed did not work satisfactorily for two types of piles under one set of soil conditions, and that it therefore had decided against investing more money in further research. This did not mean Raymond had found the "method unsatisfactory" (ENR June 11, p. 28), however, and Mr. Kinneman later expressed interest in investigating the possibility of purchasing one of the Soviet vibrators.

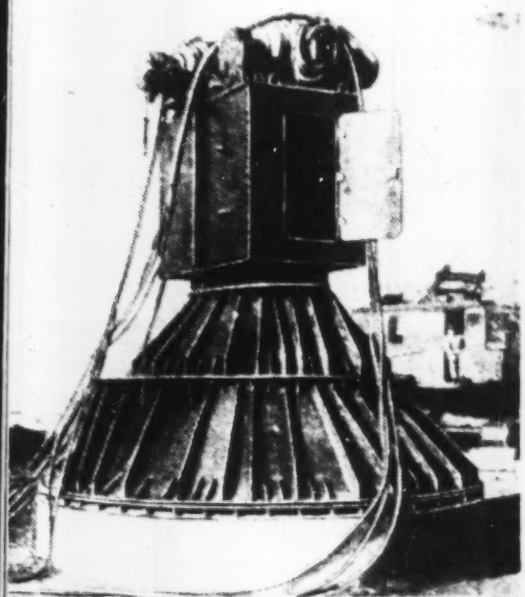
Generally speaking, the vibro-method is of particular advantage in waterlogged sands and gravel and in driving steel sheetpiling. It is least advantageous where appreciable point resistances have to be overcome in cohesive soils. Nevertheless, Soviet models of vibrators have been successfully used in different types of soils for sinking large, open-end, precast, thin-shelled reinforced concrete cylinders under many bridge piers, including the large new bridge across the Yangtse River in China (references 7 and 8).

One of the interesting new features of heavy Soviet vibrators is the use of several (up to eight) eccentrically-weighted rotating shafts, part of which rotate at half the speed of the others. The result, shown in the accompanying drawing, is that the downward component of the exciting force is larger than the upward component. Field experience showed that this was particularly effective.

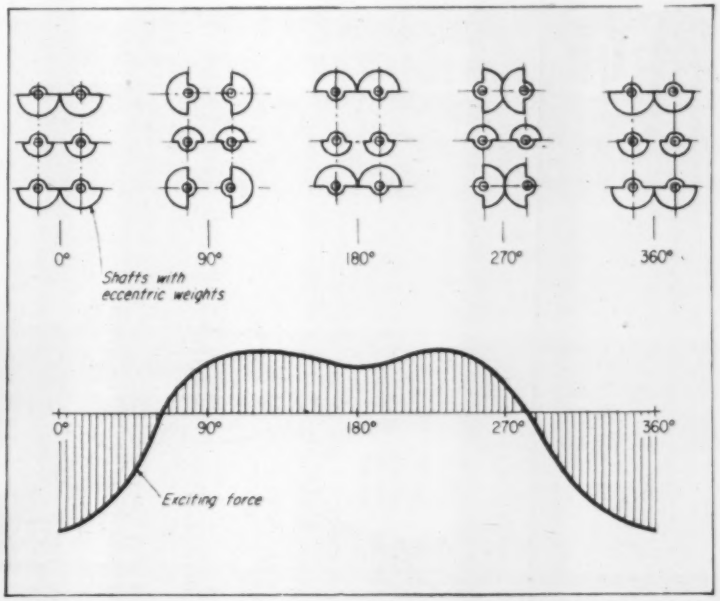
The vibrator of the drawing (Soviet model VP-4) weighs 11.75 metric tons and creates a maximum downward exciting force of 90 tons when operated at 735 rpm by a 155 kw motor. Replacement of bearings becomes necessary after a total of some 500 hours of operation.

Still larger capacity vibrators (see photo) have been built and have successfully sunk hollow thin-shelled reinforced concrete cylinders of 16.5 ft diameter to a depth of 115 ft. Soil was

Author Gregory P. Tschebotarioff is professor of civil engineering at Princeton University, and an associate in the consulting engineering firm of King & Gavaris, New York City.



TWO VIBRATORS atop a mounting develop a downward exciting force of 320 metric tons.



SCHEMATIC DIAGRAM shows how exciting force of a six-shaft vibrator varies with the position of the eccentric weights attached to the shafts.

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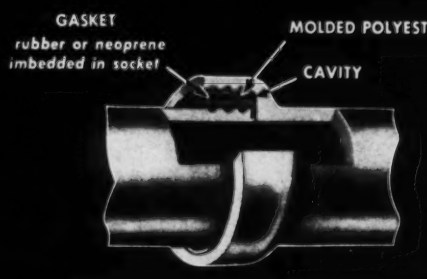

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. . . Russian pile driving

removed from the interior of the shell in several stages. The two such vibrators, shown mounted together, weigh 10.4 metric tons each, and at 900/450 rpm develop a total downward exciting force of 320 metric tons.

• **French claims**—With this much evidence of Soviet progress in vibratory pile driving, it was surprising to read an assertion (in a letter to the National Academy of Sciences) that "a Frenchman invented the machinery to accomplish the vibratory driving and extraction of piles," and that a U. S. patent had been secured by him. There can, of course, be no such thing as "the" machinery for vibratory driving, just as no single type of pile hammer can reasonably be described as "the" machinery for impact driving. It is also significant that there was no French discussion of Dr. Barkan's paper (reference 5) at the 4th International Conference, which would indicate that the vibro method has not been used to any extent in France.

Nevertheless, there is a U. S. patent (#2,743,585), which was granted May 1, 1956 to Francois Berthet of Algiers and Jacques Desvaux of Paris. In view, however, of the historical background outlined above, it appears doubtful that the rather generalized claims made in the patent could be sustained.

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(7) Yi-Sheng, T.E., Mao "The Yangtze River Bridge at Hankow, China", Civil Engineering, New York, Dec. 1958, pp. 54-57.

(8) K.S. Silin; N.M. Glotov; A.P. Gretzov; V.I. Karpinsky; V.D. Prohorov. "Bridge Pier Foundations of Composite Reinforced Concrete Cylinders" (in Russian), 199 pages, State Publishing House for Railroad Transport, Moscow, 1958.

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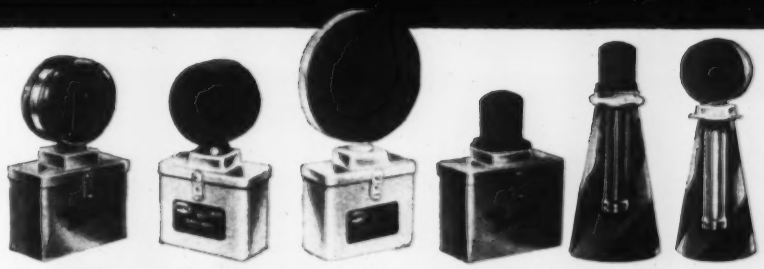

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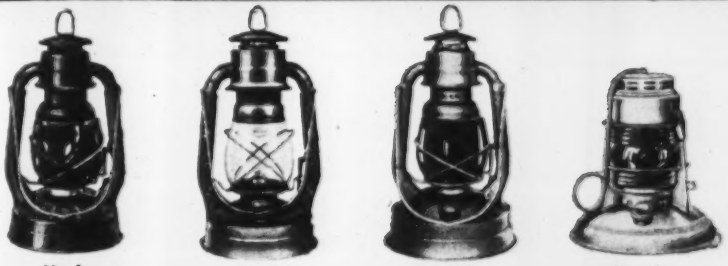

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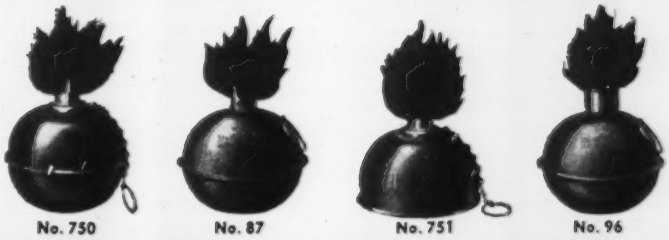

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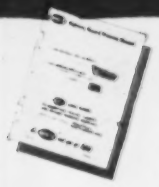

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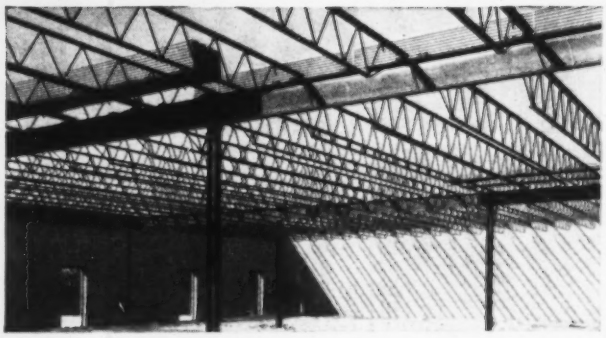

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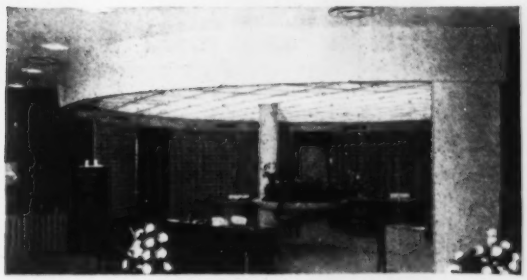

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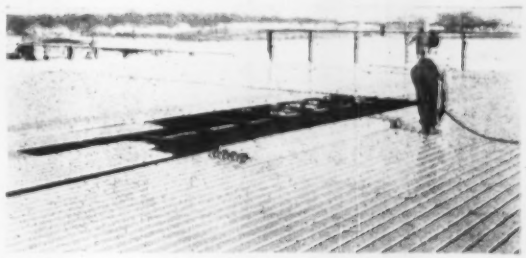

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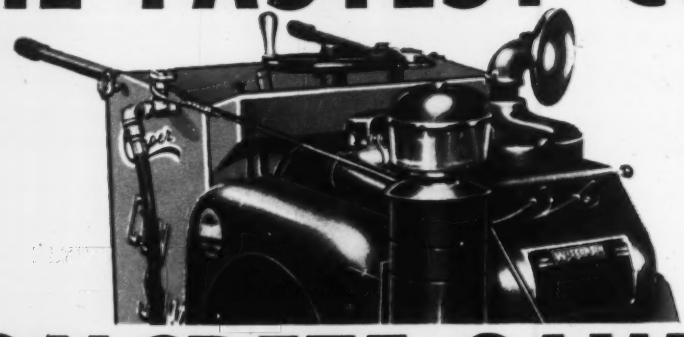

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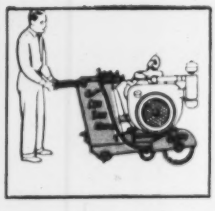

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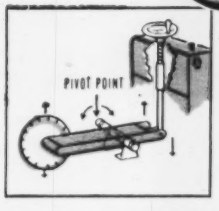

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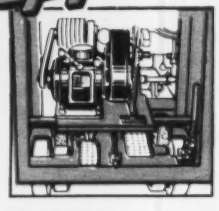

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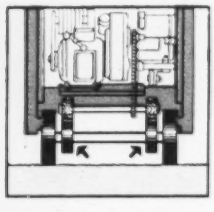

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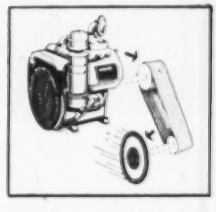

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Rigging for a 20-Ton, 250-Foot Lift

Arrows mark path of air conditioning units to the roof.

The air conditioning equipment for Boston's new Travelers Insurance Building is located in a machinery house on the roof. It's an efficient location, but it posed difficulties for the contractor charged with lifting the equipment to its high perch.

The units to be raised weighed 20 and 7 tons respectively. They were 15 ft long, and the largest was 10 x 8 ft in other dimensions. The lift was 250 ft to the roof above the 16th floor.

A 19-story tower section jutting out 13 ft (one bay) from the main building, offered the rigging contractor, E. H. Hinds, Inc. of Boston, the best location for his operations. The hoisting block would be installed near the top of this tower section, and thus higher than the main building roof.

The corner formed by the tower and the main building afforded two sides from which to work and shelter from the wind during the careful hoisting operation.

There remained the problem of moving the air conditioning units laterally to the roof once they had been raised to full vertical height. This was accomplished by building a temporary platform on the 17th floor of the tower (roof level of the main building) that could be cantilevered out under the units as they hung from the hoisting lines.

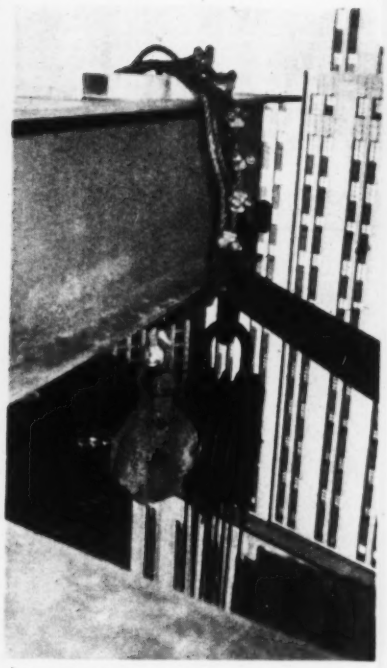
Lowered to this platform, the units could then be rolled onto the roof and across to the machinery house.

In rigging for both the hoisting block and the cantilever platform, as well as for the roof tracks on which the units would be rolled, an essential requirement for this operation was to carry all loads to building columns as directly as possible.

For the hoisting block, a 24-in. I beam was first welded between the wall columns of the tower just above the 19th floor. Then on top of this beam and at right angles to it another 24-in. beam was set, cantilevered in both directions.

The hoisting block was attached at the end of the outboard cantilever of this catshead mast, 8 ft beyond the building line. The inboard end of the beam was made long enough to reach back to and under another 24-in. I beam, welded between the building columns in the next line in from the

By Frederick D. Rugg, *of E. H. Hinds, Inc., millwrights and riggers of Watertown, Mass., specialists in machinery and plant moving.*



Catshead mast includes support and hold-down beams (left) and projecting end with lifting blocks (right).

wall. The catshead mast was welded to this hold-down beam and also to its supporting beam at the wall face. Steel rod yokes were also installed at this latter location.

Web stiffeners were welded to both the supporting beam and the catshead mast at their point of intersection and angle iron braces were installed between the outboard end of the mast and the ends of the supporting beam. Before the mast was erected, reinforcing plates were welded at the end and a 3⅛ in. hole drilled to take the 3-in. shackle pin for the hoisting block.

For rigging the cantilever platform the same arrangement of a wall beam and a hold-down beam, welded between the columns, was used. The platform itself was composed of 12-in.-wide flange beams, diagonally braced and welded.

Two five-ton chain falls were installed to pull the platform out to its cantilever position, where (each time after an air conditioning unit had been hoisted) it was provided with a deck of 8x8-in. timbers. A battery of fourteen 6-in.-dia rollers, 8 ft long, installed on this deck, provided the carriage onto which the air conditioning units were lowered.

To move the units from this platform to the roof and across to the machinery house required a special runway. This consisted of two lines of beams rigidly cross braced and placed across the tops of the columns of the main building to which they were attached by knee braces. On top of these beams was placed a solid pad of 8x8-in. timbers (every third timber bolted to the I

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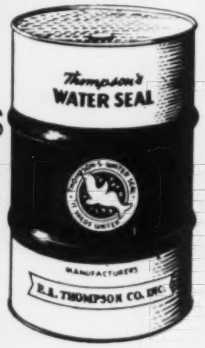

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. . . Rigging to lift 20 tons 250 ft

ROOF RUNWAY allows air conditioning units to be rolled across to machinery house.

beams). Finally, a flooring of 3x8-in. timbers was installed. Their tops were dressed smooth to cut down frictional resistance to the rollers.

For pulling the air conditioning units across this runway, an electric winch was installed on the far side of the main building roof. It operated through a four-part block-and-fall reeved with 1¼-in. rope.

Lifting the air conditioning units from the ground required no unusual rigging, although the setup had to be of large capacity. The four-part block at the catshead mast weighed 650 lb and was rated at 64 tons capacity with a 32-ton safe working capacity. A total of 2,600 ft of ⅝-in. cable, weighing 2,050 lb, was reeved through the block. The slings, shackles, clips, hooks, blocks and other gear required, together with the calculated friction and impact, plus the lift itself, was estimated to total 64,000 lb. Considering the five-part reduction, it was calculated that the cable going onto the drum of the hoist would have a direct pull of about 10,000 lb.

The winch used was rated at 50 tons. It was secured in position by five strands of ⅝-in. cable attached to a 10-in. I beam, 12 ft long, inserted 6 ft into the ground and anchored in 3 cu yd of concrete.

The rigging and lifting plan was developed by Martin Culity and Richard J. Leonard, engineers for E. H. Hinds, Inc., in cooperation with William C. Custer, engineer for the George A. Fuller Co., the general contractor.

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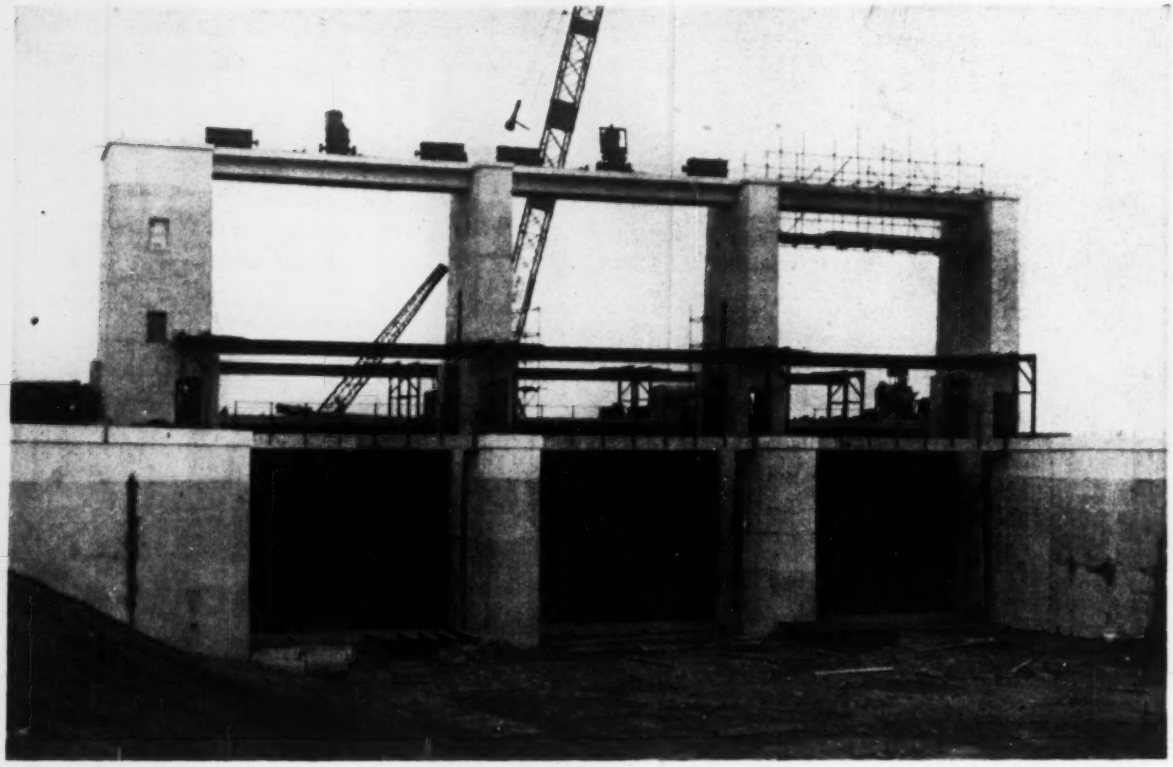


OUT Head sluice diverts river's flood water into relief channel to protect low-lying marshlands.

How Flood Relief Protects British

British engineers are finishing the first portion of a $23-million project to control flooding and erosion in the peat marsh of eastern England. It is the latest in a series of projects dating back to Roman times to drain and protect an 800-sq mi area of marsh lands that is of particular value to the country's agriculture.

The chief flood problem is in the area around the Ouse River. Other portions of the marshes are adequately drained, partly through two 17th century relief channels.

• **Three-part project**—The Great Ouse Flood Protection Scheme consists of three parts. The first stage is an 11-mile flood relief channel paralleling the river. It was started in 1954 and is near completion. Stage two calls for widening and deepening the river along a 19-mile stretch above the relief channel. This was started in 1957 and is scheduled for completion in 1962. Stage three will be a 29-mile channel to cut off flood waters before they reach the marshes.

The relief channel will increase capacity for discharge into The Wash, a bay of the North Sea, by diverting flood runoff from a portion of the Ouse. Flood water will be admitted to the relief channel through the head sluice at a point about 17 miles from the river mouth. It will be discharged back to the Ouse during low tide through the tail sluice five miles from The Wash. The channel will be capable of holding 7,680 acre-ft.

Width of the earth channel varies at the top of the banks between 240 ft and 461 ft, and at bed level between 75 ft and 261 ft. Side slopes range between 4:1 and 2:1. Depth below the top of the banks is 20 to 27 ft.

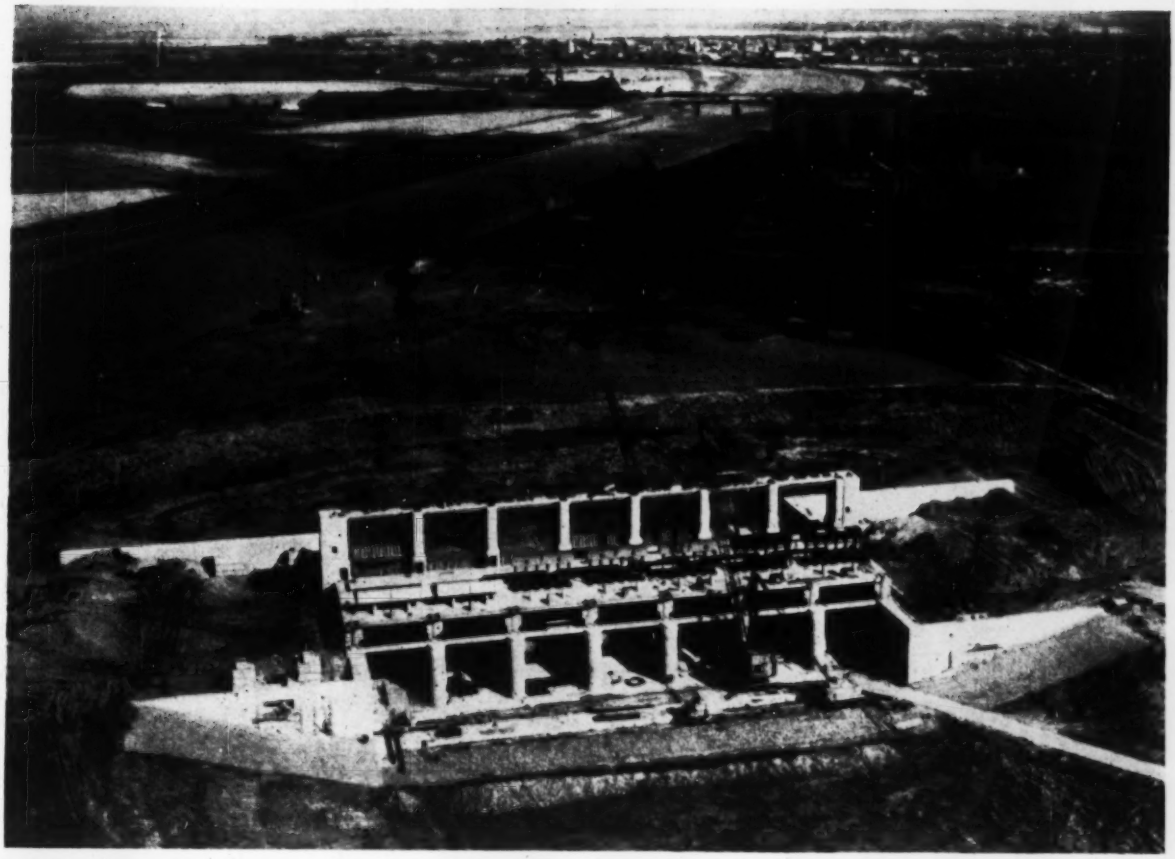
The largest single structure in the project is the tail sluice of the relief channel. It will discharge 20,000 cfs. through seven bays, each 30 ft wide. Each bay is controlled by a power-operated steel lifting gate, plus an automatic flap gate to prevent reverse flow into the channel when the tidal water in the Ouse is higher than the level in the channel.

• **Subsoil problems**—Buttery clay subsoil conditions existing at the site didn't permit open-cut excavation. To avoid the expense of cofferdams in building the abutments and wing walls, concrete sections were precast and sunk to a depth of 42 ft.

The nature of the soil through which the channel was excavated—a soft clay with a low sheer stress—created handling problems. Dragline excavators fed spoil to a large steel hopper on a mobile conveyor. Spoil was carried from the hopper by conveyor belt, which either dumped it directly onto the spoil heap or passed it to another hopper feeding a mobile elevating spreader for distribution over a wider area.

The head sluice has three bays, each 30 ft wide, controlled by vertical-lift steel sluice gates operated by electric motors. Since it is not in tidal water, there was no need for flap gates. Full width of the sluice measures 261 ft, with the height of the steel sluice gates 22½ ft.

• **Wider and deeper**—Second stage of the project—widening and deepening the river and the Ely Ouse over a distance of 19 miles—is being carried out chiefly with floating grab dredgers and



BACK IN Discharge sluice at end of relief channel sends flood waters back into river near mouth.

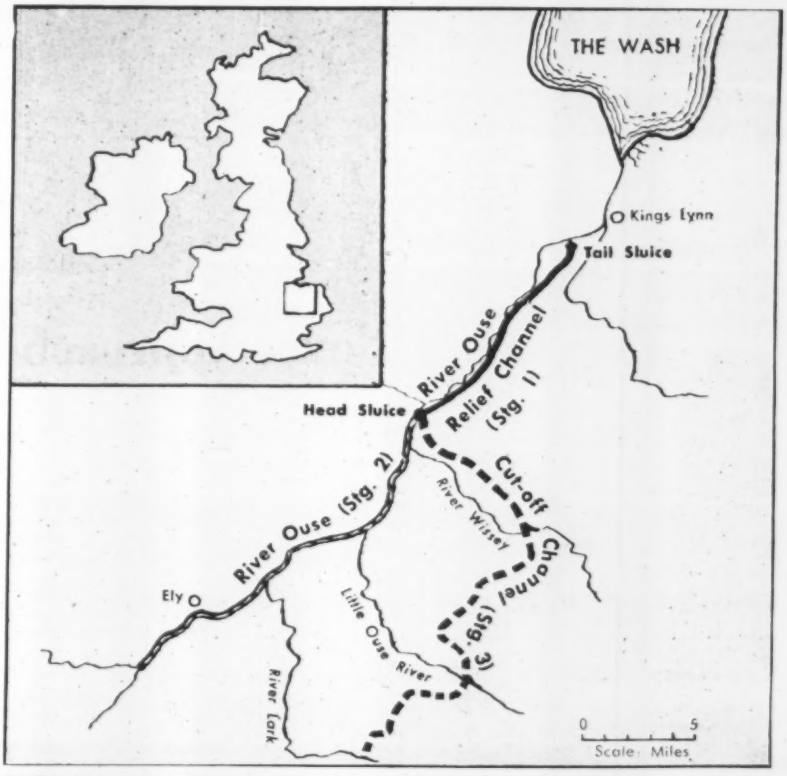
Lowlands

one bucket dredger, coupled to a belt conveyor to distribute spoil along the banks.

The 29-mile-long cutoff channel (stage 3) will follow the eastern edge of the marshes, and is intended to intercept flood waters of the Lark, Little Ouse and Wissey rivers before they enter the marsh area. The cutoff will pass under the Little Ouse and the Wissey through concrete siphons. Floodwater from them will be diverted into the cutoff along short by-pass channels controlled by sluices.

Bed width of the cutoff channel is 70 ft at the mouth, 14 ft at the head. Water depth varies between 6 ft and 13 ft. The cutoff will join the relief channel just before the head sluice. Discharge capacity of the cut-off channel exceeds 4,000 cfs.

The project is being carried out for the Great Ouse River Board, with the aid of a loan by the Ministry of Agriculture. It was designed by Sir Murdoch MacDonald and Partners. Sir Robert McAlpine and Sons, Ltd, are the general contractors for Stage One, and Derek Crouch (Contractors) Ltd, for Stage Two.



PROJECT consists of 11-mile relief channel, deepening of river, and cut-off channel.

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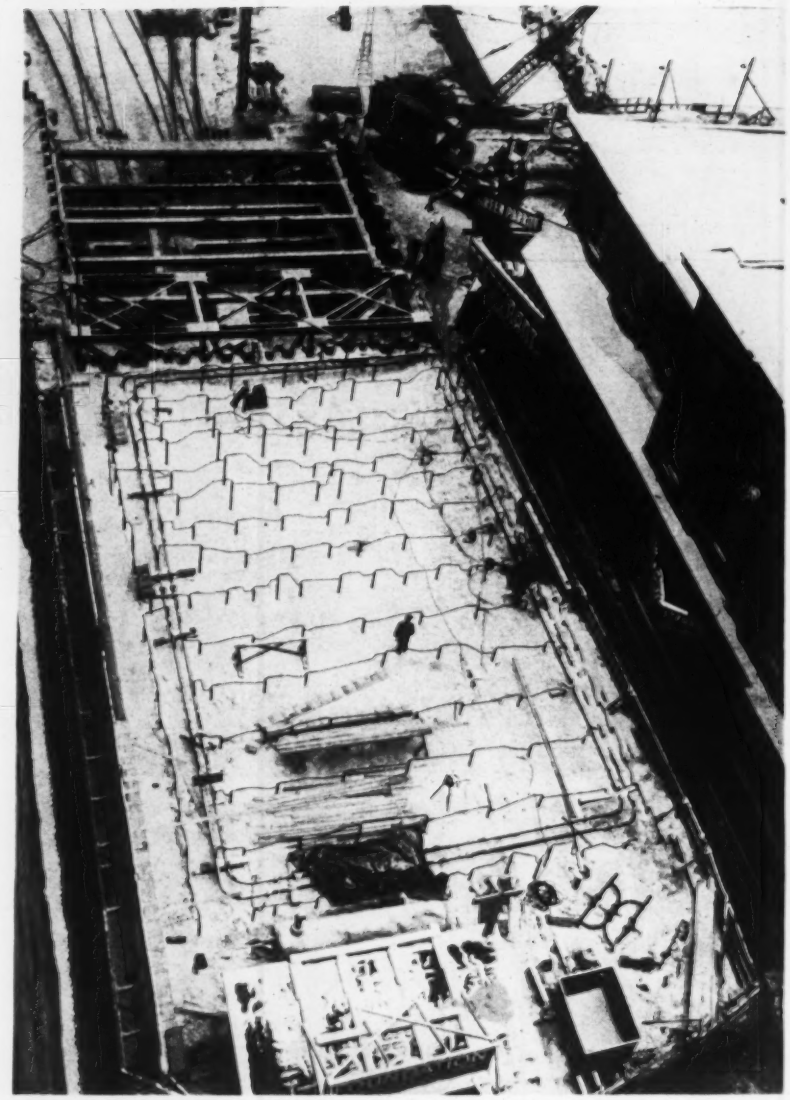


Water-laden silt under a Montreal street was frozen for a . . .

Novel Approach to Tunneling

A technique new to Canadian construction practice—the use of refrigerants to freeze a sub-surface area and permit tunneling to go on below it without danger of subsidence—was used this year in the complicated rebuilding of a railroad tunnel in downtown Montreal.

The project was the removal of 144 lin ft of center supporting wall and two roof arches inside the Central Station end of the Mount Royal rail tunnel. A single reinforced concrete arch roof was to be erected in their place.

The work couldn't be done from inside the tunnel because rail traffic had to be maintained during the day. Only 64 lin ft of the work could be done from an open cut because of the geological and architectural condition of the area.

The first 64 lin ft of the project, where the tunnel passed at right angles under Cathcart St., were done through an open cut. But this approach was impossible after the tunnel began to run under and parallel to McGill College Ave.

The buildings on both sides of the avenue are on foundations that do not go down to rock 25 ft below pavement level and they are built close to the street.

From pavement level to a depth of 8 ft is hard clay. Below that, to a depth of 17 ft, is a layer of fine silt with a heavy water content. A layer of hard

For economy and low maintenance the better value is

REYNOLDS ALUMINUM

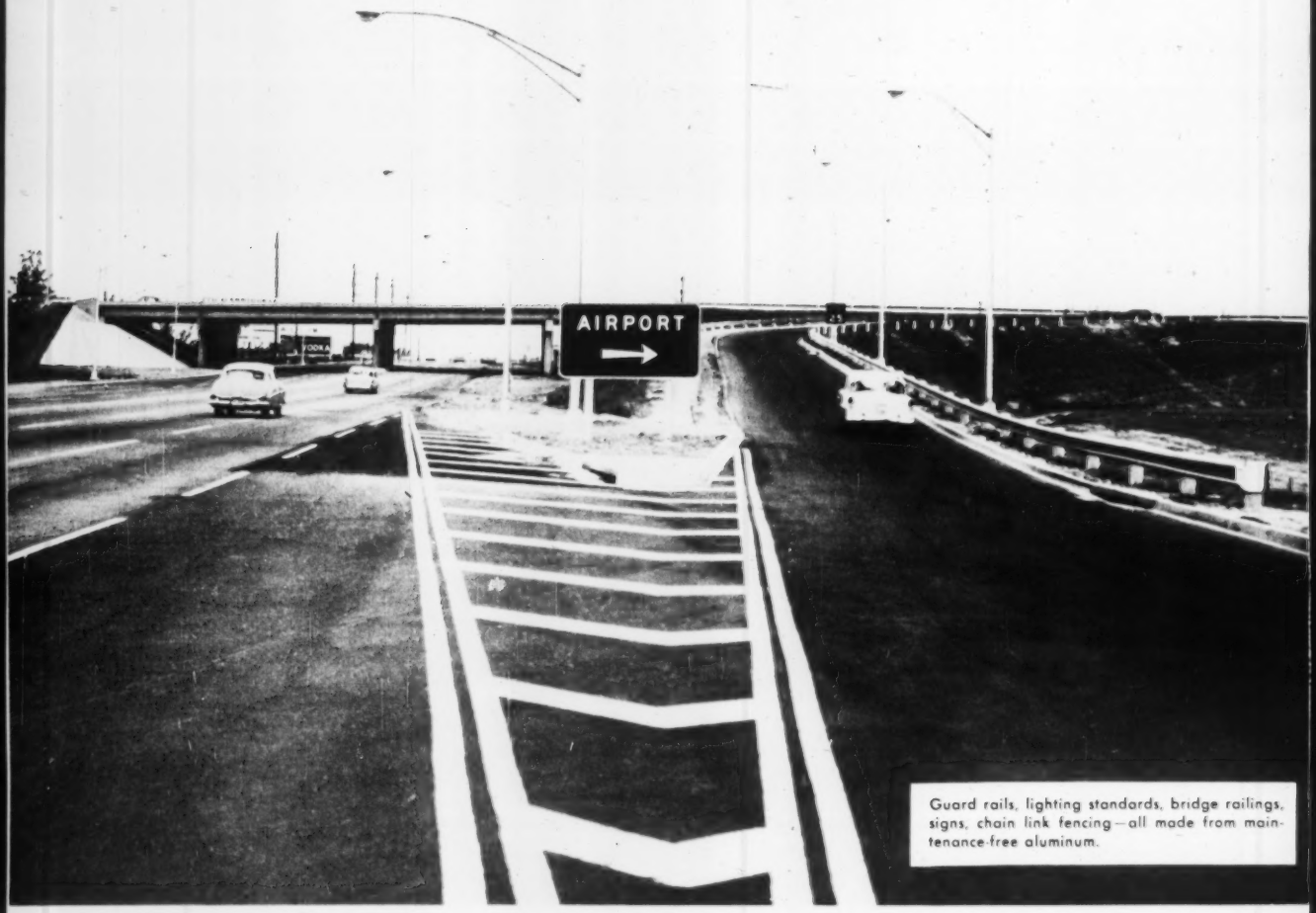
Reynolds Commercial Roof Deck (more than 120,000 square feet of it) was used in this new processing plant to achieve fast and easy installation, low first cost, good insulation and minimum maintenance over the years. Once again, Reynolds Aluminum was the best material for an important construction job. For detailed information about the many uses of this versatile roofing product write: Reynolds Metals Company, Richmond 18, Virginia.

GERBER PRODUCTS CO. BUILDING
Asheville, N. C.

ARCHITECTS: Six Associates,
Asheville, N. C.

GENERAL CONTRACTOR:
H. L. Coble Construction Co.,
Greensboro, N. C.

Maintenance-Free Aluminum makes sense in America's Expanding Highway Program



Guard rails, lighting standards, bridge railings, signs, chain link fencing—all made from maintenance-free aluminum.

Durable, rust-free, modern-looking, easy to fashion, easy to handle, competitive in first cost—these are only some of the reasons why aluminum is rapidly replacing older materials in highway construction. Everything you see in metal in this new Miami International Airport interchange is Reynolds Aluminum. Here, as in scores of other recent highway construction projects, the beauty of aluminum is much more than skin deep to engineers, taxpayers and highway users alike.

Proved in the field by impact test aluminum guard rails are safe. And they never need painting.

Many shapes in maintenance-free aluminum provide the designer with the widest possible latitude for bridge railing design.

TERMINAL DEVELOPMENT PROGRAM
Miami International Airport, Miami, Fla.

OWNER:
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CONSULTING ENGINEERS:
Howard, Needles, Tammen & Bergendorf, New York, N. Y., Kansas City, Mo. and Miami, Fla.

GENERAL CONTRACTORS:
Troup Brothers, Inc., Miami, Fla. John C. Peterson Co., New York, N. Y. and Pecon Corp., Miami, Fla.

BRIDGE AND GUARD RAILING:
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LIGHTING STANDARDS:
Pfaff & Kendall, Newark, N. J. Union Metal Company, Canton, Ohio

SIGNS AND SIGN STRUCTURES:
Traffic and Street Sign Company, Newark, N. J.

CHAIN LINK FENCE:
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Aluminum chain link fencing is *permanent* fencing. It cannot rust, never needs painting, requires no maintenance—first cost is the last cost.

Modern engineering and architectural design is best expressed by the clean, soft tones of aluminum. Rich in appearance, resistant to the elements and easy to work with, aluminum is the *proudest* of the metals. Reynolds engineers will be glad to work with you in achieving better design and longer-lasting construction in America's growing highway program. For additional information and illustrated technical publications about Reynolds Aluminum highway products write: Reynolds Metals Company, Richmond 18, Virginia.

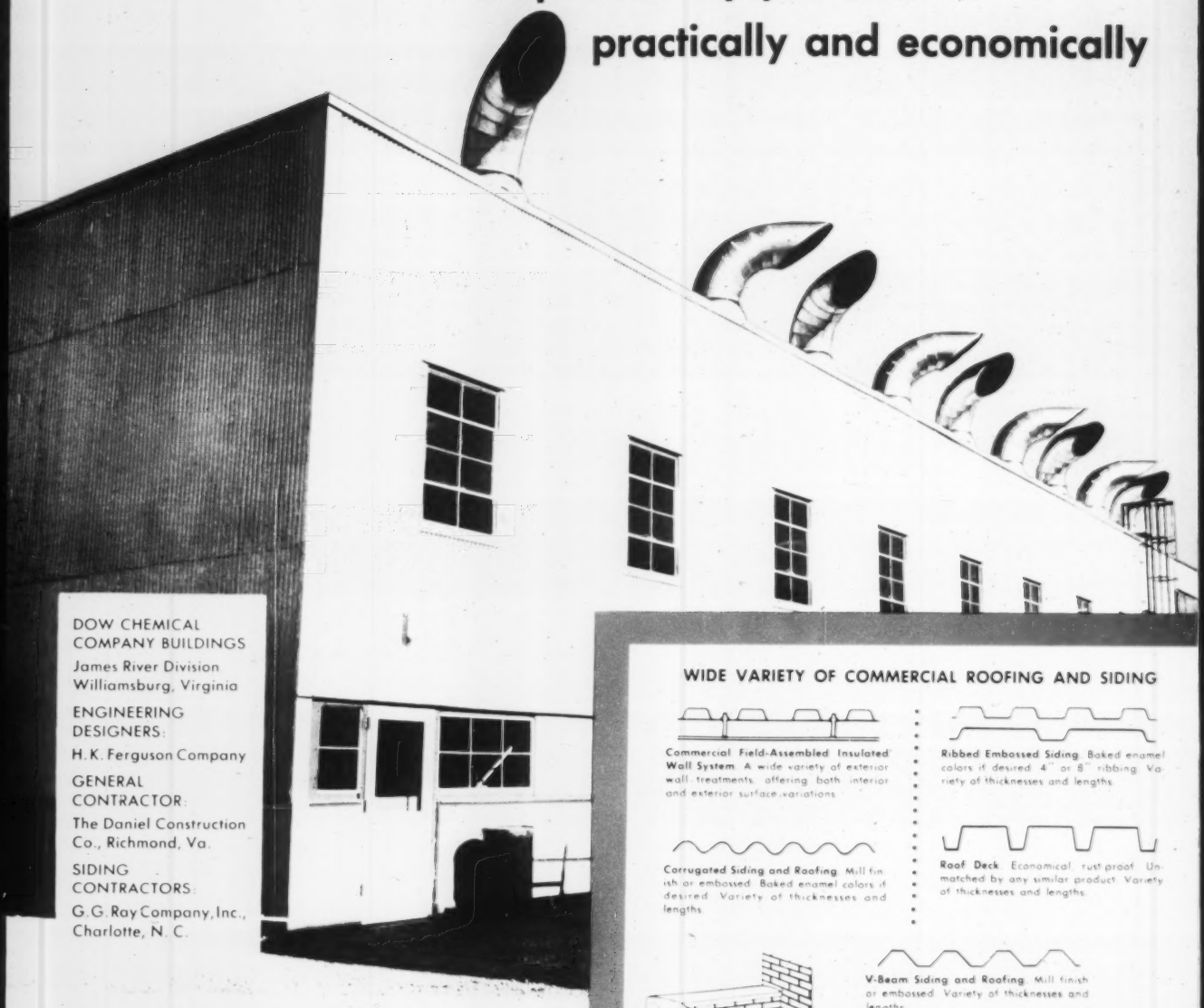
Aluminum lighting standards have a life expectancy almost unlimited, with no painting and re-painting. And aluminum highway signs are just as practical.

Wherever Highways Go...

REYNOLDS ALUMINUM

REYNOLDS ALUMINUM

helps industry produce . . . practically and economically



DOW CHEMICAL COMPANY BUILDINGS
James River Division
Williamsburg, Virginia

ENGINEERING DESIGNERS:
H. K. Ferguson Company

GENERAL CONTRACTOR:
The Daniel Construction Co., Richmond, Va.

SIDING CONTRACTORS:
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Ribbed Embossed Siding. Baked enamel colors if desired. 4" or 8" ribbing. Variety of thicknesses and lengths.

Corrugated Siding and Roofing. Mill finish or embossed. Baked enamel colors if desired. Variety of thicknesses and lengths.

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Coping and Gravel Stop. Rust free aluminum is more and more the preferred material for Coping and Gravel Stops. Durability and efficiency at low cost.

This important industrial plant comprises 13 buildings, 6 of which are sided with Reynolds Aluminum. Originally another product was proposed. After figuring material handling costs, the difference made aluminum the *best buy*. More than 57,000 square feet of Reynolds Aluminum Corrugated Siding were used. Again, aluminum did the job best!

The job is done best with

REYNOLDS ALUMINUM

Watch Reynolds TV show "Walt Disney Presents" Friday Nights on the ABC TV Network

soil lies between the silt and the solid limestone.

Excavating from the street down to the tunnel would have endangered the foundations of the adjacent buildings.

The contractor, Foundation Co. of Canada, Ltd., Montreal, and F. O. Stewart, consulting engineer for the owner, Canadian National Railways, decided to freeze the water-saturated silt and excavate for the new roof by tunneling from one end.

They placed 170 double-walled pipes in the 80x50-ft area. The pipes went down from 18 ft to 20 ft and were about 4 ft apart. Methanol, cooled to −10 F in a heat exchanger, was pumped through the pipes.

Although new to Canadian construction, this method has been used to stabilize soil in deep-shaft mining through heavy over-burden and, in a similar fashion, in salt-mining operations in the Windsor, Ontario, area.

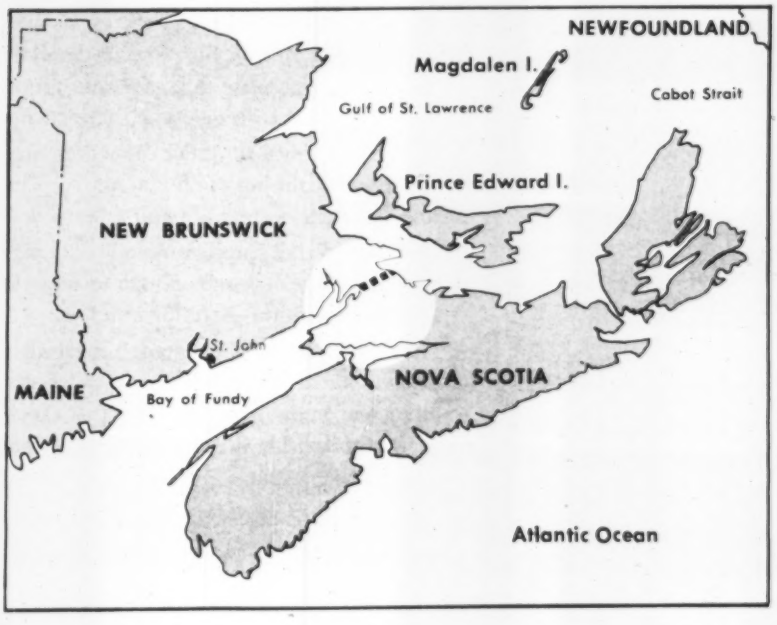
The primary refrigerant, Freon-12, was compressed and circulated through the heat exchanger by two 75-ton, electrically driven compressors that ran continuously through the five months of work.

Foundation Co. allowed the apparatus four weeks to freeze the silt solid before tunneling in over the roof of the old tunnel. The roof of the excavation proved to be solid and self-supporting as long as it remained frozen. It was shored up with steel immediately after excavation.

A single-arch reinforced concrete roof was constructed over the top of the old two-roof arches. When this single roof was completed the contractor began to remove the original roof arches and the center wall.

Working at night, when no trains were using the tracks, the crews removed about 5 lin ft of the roof and wall each night. Debris was taken away in cars before regular daytime service had resumed.

The single arch roof, without center support, permitted the installation of a double crossover near the mouth of the tunnel. Previously, trains had to travel 1,600 ft into the 3.15-mile tunnel before reaching a crossover.



Canada Studies Nova Scotia Canal Plan

Canada is studying the possibility of constructing a canal across the narrow neck of land connecting the provinces of Nova Scotia and New Brunswick. The canal would be about 15 miles long, connecting Northumberland Strait with the Bay of Fundy. Cost is estimated at $80 million to $100 million.

Foundation Engineering, Ltd., Montreal, has submitted a report to the Canadian Department of Transport recommending a one-lock canal instead of the two-lock canal proposed in earlier reports.

The transport department is now carrying out a traffic study of the proposed project.

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The C5 contains a 5000 lb. Ram which, powered by a 600 cu. ft. air compressor, delivers 16,000 ft.-lb. blows 110 times a minute. Master engineered for higher productivity, precision manufactured for matchless durability — accept less and the ultimate cost will be more!

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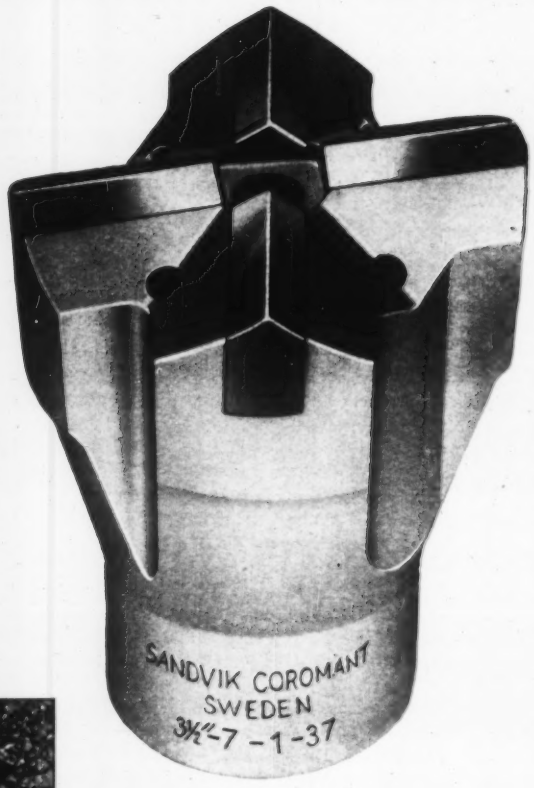
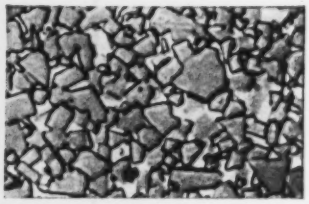
Longer bit life— with *new* Sandvik Coromant Bits





Sandvik Coromant Tungsten Carbide (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities —therefore stronger, longer-lived.

Low quality Tungsten Carbide (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

Type	Thread	Available Diameters, in Inches															
		1¼	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2¾	3	3½	4	4½	5
SHOULDER	TAPER	x	x	x	x													
	F		x	x														
	113		x															
	H			x	x	x	x	x		x								
	115			x	x													
	D						x	x	x	x	x	x	x	x				
	K													x	x	x	x	
BOTTOMING	1" Rope				x	x	x	x		x								
	1¼" Rope						x	x	x	x		x		x				
	400						x	x		x		x						
	1½" Rope											x	x	x	x	x		
	600											x	x	x	x			
	700													x	x			
	J7.5															x	x	
	2" Rope														x	x	x	x
	1000																x	

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used —as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels — the most widely used in the world — and Sandvik Coromant extension steel equipment.

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
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COlfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, California
LYtell 1-0375

A Mechanized Culvert-Cleaner

Maintenance crews of the Arizona Department of Highways are cleaning out box culverts with a tool that is basically a giant hoe—a grader blade attached to a 21-ft boom.

The boom is hooked to a tractor or end loader. The blade is inserted in a culvert, lowered, and withdrawn. Dirt and debris are dragged out—and so are scorpions, snakes and black widow

For circular culverts a collapsible disk, inserted horizontally, drops into position to pull out debris.

The tool was devised by E. J. Kinney, maintenance foreman at Prescott. The department had needed 16 man hours to clean an average culvert box. The cleaner does the job in 30 minutes.

Slim, Trim Piers Avoid Skew

Slim steel piers of welded-box section carry a 37-ft interchange roadway over four separate divided highways on a new Interstate expressway near Dallas, Tex.

The 1,540-ft-long overpass is, for the most part, on a 7-deg curve. It crosses the highways at varying skew angles.

The use of steel piers at these points avoided the need for either skewed piers or longer spans.

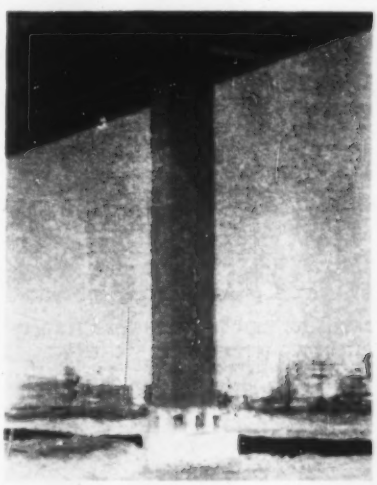
The four longitudinal girders of the superstructure are continuous wide-flange beams. Maximum span is 99 ft.

By framing the beams into the cantilevered caps of the T-shaped piers, the caps are kept above the vertical clearance line of the roadways underneath, and are therefore independent of the horizontal clearance line.

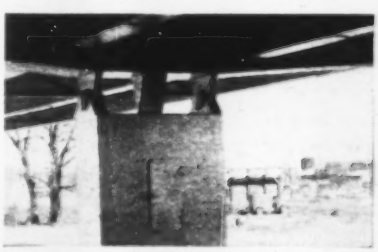
The box-section, steel-pier shaft with its steel pier-cap also avoids the wider shaft that steel shoes on top of a concrete pier would have required. The wider shaft would have meant a longer span to keep the shaft outside the horizontal clearance lines.

Steel piers are carried down to roadway level, with concrete foundations below this level.

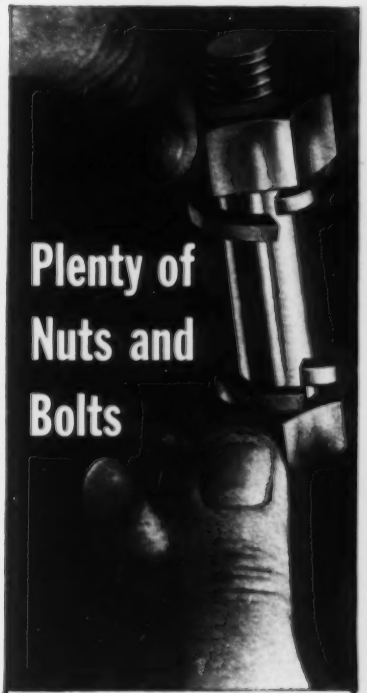
Most of the arc welding on piers and cantilevered caps was done in the field. Where the longitudinal beams frame into the cross-members of the steel piers, tie plates connected by high-ten-



PIER SHAFT is arc-welded steel plate in a slim box section.



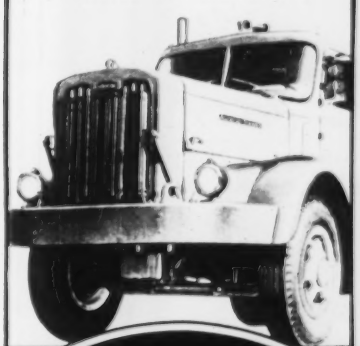
ROADWAY BEAMS frame into weld-fabricated cantilevered cross-member.



. . . another reason for

Autocar's fine reputation

Nut and bolt assembly is far superior to the usual riveting and welding method in building a truck. It makes for more durable construction, lower maintenance and easier replacements in service. It is just one more quality characteristic that makes the Autocar "the world's finest".



Autocar
"World's Finest"

Division of
The White Motor Company
Exton, Pennsylvania

sile steel bolts are used to take care of the negative moment.

Between the roadways, the interchange road crosses a flood storage basin and a creek. Concrete T-shaped piers are used in these areas.

The bridge was built by the Texas Highway Department. Designer was Douglas A. Nettleton, district bridge engineer; Frank W. Cawthon, district engineer, is in charge of the work of which the bridge is a part.

Rock and Wall Work at Salzburg Music Festival

Europe's newest opera house is under construction in Salzburg, Austria, scene of the annual Salzburg Music Festival.

Designers had a double problem at the site. One was the original festival hall's front wall, which dates from 1650; the other was Monk's Hill, a rock mass rising 600 ft behind the hall.

Ground between the hill and "front wall" is mud, clay and gravel in flat strata. And there's an underground rock step 33 ft out from the side of the hill. Topping it off, the venerable "front wall" leaned out 8 in. into the street.

Changing the wall's position was unthinkable. Building a new opera house of any decent size between it and the hill was impossible.

Here's how architect Clemens Holzmeister designed around and through these elements.

So the builders cut 72,000 cu yd of rock out of the hill to make room.

The new stage, covering 17,200 sq ft, extends into the rock cut. To the front, it's built in five independent sections on floating foundations in the clay and mud below.

An 8-in.-thick concrete wall, in line with the front of the stage, sits on the edge of the underground rock step. It stands 118 ft high and runs 263 ft without expansion joints.

Here's why there are no expansion joints. The entire wall rests on two underground columns extending down 30 ft to the rock "step." These supports are flexible enough to allow the whole wall to expand a maximum 20 millimeters (0.787 in.).

The old front wall has been carefully taken apart, piece by piece. The original facade will go back just as it was—and where it was—on a reinforced concrete wall. This gets rid of the 8-in. lean and provides bearing for the frame of the 2,300-seat auditorium.

Completion is scheduled for early next year, in time for the 1960 Salzburg Music Festival.

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THE SOLOMON R. GUGGENHEIM MUSEUM OF NON-OBJECTIVE ART, New York City

ARCHITECT: Frank Lloyd Wright

GENERAL CONTRACTOR: Euclid Contracting Corp., 101 Park Avenue, New York, New York

ROOFING CONTRACTOR: United Roofing & Water Proofing Corporation, 1666 Bergen Street, Brooklyn, New York

All-Weather Protection for a unique architectural wonder...

Job-Engineered Ruberoid Built-Up Roofing

The beautiful, new Solomon R. Guggenheim Museum of Non-Objective Art is symbolic of a unique spirit in architecture, Frank Lloyd Wright, and a great New York philanthropic foundation.

Ruberoid Built-Up Roofing tops this modern structure with the dependable protection that only high-quality specifications and skillful application can assure:

FLAT ROOF AREAS: 17,400 square feet of Ruberoid Air-Vent asphalt felt and Special Bitumen with gravel finish.

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Many extra years of weather-tight service and low maintenance are certain on every project where Ruberoid Built-Up Roofing is specified. Job-engineered Ruberoid Built-Up Roofing installed by approved roofers proves its economy in lasting durability. Write for detailed specification data. The RUBEROID Co., 500 Fifth Avenue, New York 36, New York.

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ASPHALT AND ASBESTOS BUILDING MATERIALS

see our catalog in **S** or write for copy

Seismic Soundings: A New Way to Make

1. Make Them With a Hammer as the Wave

TWO-MAN CREW makes the seismic soundings. One does the hammering; the other watches the oscilloscope to determine first-wave arrival time.

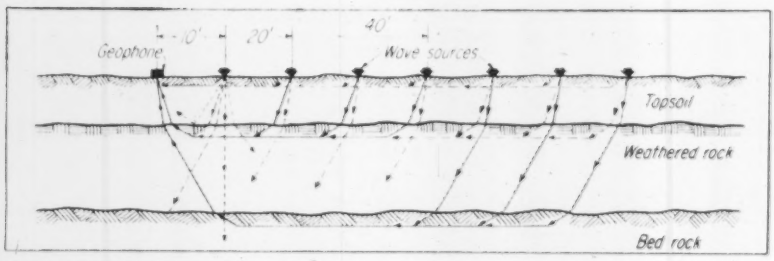
A hammer blow instead of a dynamite explosion is used to find depth to subsurface bedrock, and its relative hardness.

The new method is a modified version of the well-known seismic technique for geophysical exploration. The fundamental seismic refraction principle remains as the basis. Depth and hardness are determined from the time it takes an earth disturbance wave to travel a measured distance.

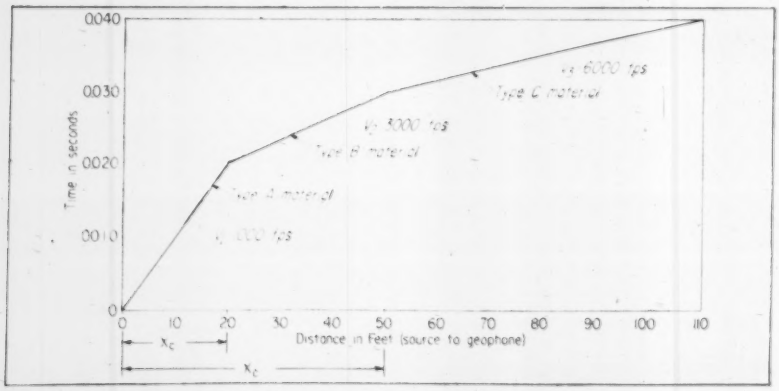
However, hammer blows on the ground originate the disturbance instead of the customary dynamite explosion. One geophone instead of several is used for detecting the disturbance.

Co-authors of this article are Henry A. Kallsen, *Assistant Professor of Civil Engineering, University of Wisconsin, and* Kenneth G. Carlson, *Associate, Mid-State Engineering Co., Baraboo, Wis.*

2. Use Them to Determine the Rippability of



FLOW PATHS of seismic waves to geophone depend on depth, thickness and composition of materials, and distance from wave source to geophone.



SEISMIC WAVE velocity (V) identifies characteristics and rippability of similar subsurface materials. X_c is used in depth calculations.

Seismic soundings with a hammer are used to determine quickly and inexpensively whether rocky underground material can be excavated by ripper and scraper in a method developed by Caterpillar Tractor Co. engineers.

Two men with 40 lb of equipment make the rippability tests. A sledge hammer blow on a steel plate induces the seismic waves, a geophone and electronic time counter records them, and a set of tables is used to help determine rippability.

• **The theory**—The seismic analysis for rippability is based on the principle that sound or shock waves travel through different subsurface materials at varying speeds and along different paths.

Speed of a wave depends upon the type and density, or consolidation, of the material. Path of the wave varies with speed and the thickness of the layers of the material through which it passes.

A shock source creates numerous waves. At short distances, the surface wave is the first to reach a receiver. As distance from source to receiver increases, waves refracted through denser subsurface material reach the receiver

Them, A New Way to Use Them

Source

And an oscilloscope-electronic unit is used in place of optical-photographic apparatus for depicting travel time.

The hammer-seismic equipment can be operated by a two-man crew. One does the hammering while the other determines first-wave arrival times by watching the oscilloscope. A 12-v battery supplies power for the unit.

Distance from the detecting geophone to the spot where the ground is hammered is measured by tape.

The hammer impact closes a microswitch, starting the timing interval, which is ended when the disturbance reaches the geophone.

Successive hammer blows are taken at varying distances from the stationary geophone. These provide the same information for drawing time-distance graphs as does the dynamite blast at a set distance from multiple geophones in the customary technique.

The new approach has been successfully used up to depths of 60 ft. This is much less than for conventional seismics, but it is no disadvantage for many engineering applications in which shallow probing is all that is needed.

A hammer instead of dynamite is a definite advantage. It permits exploration in urban areas and other places where dynamite would be a nuisance or prohibited completely.

The timing equipment provides another advantage in the new method. The oscilloscope and electronic unit make it unnecessary to carry along washing tanks, developing fluid and dark-room facilities associated with the conventional photographic display of travel times.

Site conditions sometimes impose limitations on the operation of the hammer-seismic apparatus. Excessive earth vibrations such as those caused by a passing train may disrupt operations temporarily.

Perplexing problems in interpretation of results are sometimes encountered with frozen surface soil, nonlayered heterogeneous materials, or with partially flooded sites.

A uniformly sloping bedrock surface can be detected by reversing the positions of hammer and geophone. Abrupt changes in bedrock, however, are generally troublesome to detect.

These conditions are an inconvenience, but they are usually surmountable.

The original idea for the new seismic technique came from D. I. Gough of the University of Witwatersrand, Union of South Africa. Additional development and testing have been conducted at the University of Wisconsin.

Mid-State Engineering Co. has used the new method for location studies on 12 miles of Interstate highway.

Subsurface Rock

before the surface wave. Only the first wave received is recorded for computations.

With these time and distance data, two formulas and a graph provide information on depth of layers of different density materials and the speed of the waves.

Rippability is determined by identifying the materials and relating the speeds of the waves to the materials.

• **The practice**—The shock wave is produced by an 8-lb sledge striking a 6x6x1 in. steel plate placed on the ground. Waves sharp and strong enough to provide readings to 50 ft below ground surface are produced.

The hammer is wired so that on impact a switch is closed to start the electronic counter. The counter determines the time interval between impact and arrival of the seismic wave at the geophone.

A flat-base geophone set on the ground is used if the surface is hard. A cone-shaped base is pressed into the ground for better pickup in loose soils.

The first reading is taken with the steel plate set 10 ft from the geophone. One man strikes the plate and another takes readings at the counter.

After the impact starts the counter, lights flash across it, marking the time until the seismic wave reaches the geophone. This wave stops the counter, and the steady shining light indicates time lapse.

Elapsed time for this distance is noted on a data sheet. The hammer man moves the plate out along a straight line until it is 20 ft from the geophone. Another hammer blow and reading is taken.

This process is repeated every 10 ft until the plate is 100 ft from the geophone.

A second set of readings then is run at a right angle to the first, as a check.

Knowing the time of the wave travel and the distance from the hammer to geophone, depth and wave velocity are computed.

Caterpillar has made up tables of rippability based on wave velocities for a dozen of the more common materials. Since wave velocities and rippability vary by consolidation, the tables are used to tell if a certain velocity through a certain material indicates it is rippable.

In determining rippability, separate tables must be determined for each size ripper.

Velocity (V) of the seismic wave is found by the formula:

$V = D/T$ where D is distance from plate to geophone; and T is elapsed time.

These values are plotted on a graph. Values of D go along the bottom and those of T up the side of the graph.

The resulting values of V will fall in an approximate straight line for each type of material since velocities are the same for similar consolidations.

Straight lines through adjacent points will indicate various types of materials, while the intersection of the lines will indicate changes in consolidation of the material.

Depth at which these changes in consolidation occur is computed from the formula:

$$D = \frac{X_c}{2}\sqrt{\frac{V_2 - V_1}{V_2 + V_1}}$$ where:

D is depth.

V_1 is velocity of the seismic wave in the upper layer.

V_2 is velocity of the wave in the next lower layer.

X_c is distance along bottom of the graph measured from zero to the intersection point of the lines.

(R&D continued p. 78)

message on
POWER
VALUE
for buyers of . . . Hoists Compressors • Pumps • Generators • Graders • Stabilizers • Crushers • Excavators Rollers • Loaders

To improve performance and lower operating cost, insist on P&H Diesel power for all of your NEW construction equipment and REPOWERING needs.

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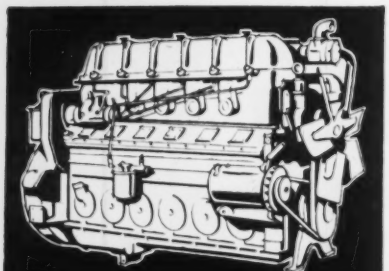
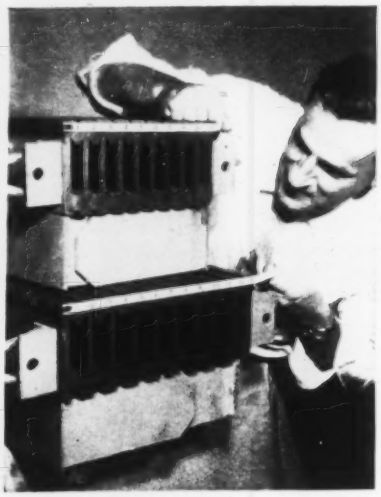
Compact, simplified P&H Diesel design results in easier maintenance—25% fewer parts, with all fittings easy to get at. All wearing parts are interchangeable. P&H Diesels in 2, 3, 4 and 6-cylinder models range from 40 to 320 h.p. See your P&H distributor, or write Dept. 412A, P&H Diesel Engine Division, Harnischfeger Corporation, Crystal Lake, Illinois.

P&H DIESEL



HARNISCHFEGER
P&H • Diesel Engine Division
Crystal Lake, Illinois

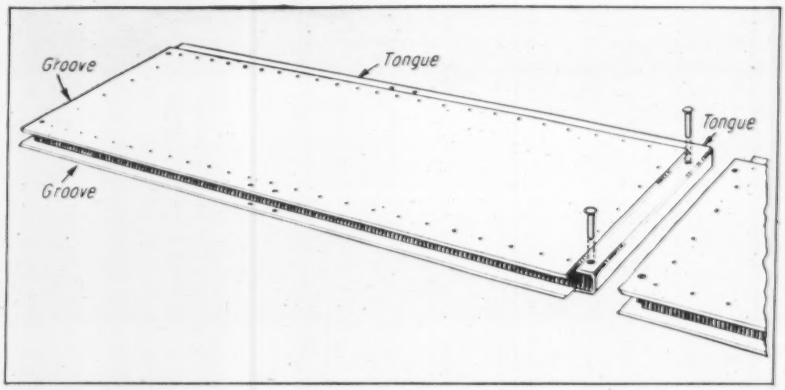
Bellows Joint Cuts Shock



Rubber expansion joints, built like accordion bellows, will be installed between concrete slabs to reduce rhythmic shock on an experimental stretch of the Baltimore-Harrisburg Expressway.

The top joint in the picture above is under compression equal to that of 3 in. of highway expansion. The bottom joint is at rest at its normal 13-in. width. In each instance the height of the joint remains the same. It is designed to stay flush with a roadway surface at all temperatures.

The joints, manufactured by B. F. Goodrich Industrial Products Co., come in 6 ft and 6½ ft widths. They are bolted together to span a road and then anchored in concrete to maintain a tight seal against water and dirt. A series of steel plates are bonded to the rubber to carry vertical loads.



Plastic Mats Make a Runway

A lightweight, plastic airplane landing mat capable of sustaining aircraft with a single-wheel load of 50,000 lb and a tire contact pressure of 200 psi on a relatively weak subgrade has been developed by the Corps of Engineers.

The mat, known as the T-12, is a sandwich structure composed of glass fiber. Phenolic resin honeycomb core material is bonded between laminated facings of phenolic impregnated glass fabric.

Individual panels are 12 ft long, 3 ft wide and 1¼ in. thick. They weigh 150 lb each.

The panels are joined by tongue-and-groove side and end connectors. Rivets at 6-in. intervals secure the tongue-and-groove connections.

The plastic panels have several advantages over landing mats of steel, aluminum and magnesium.

Plastic is difficult to locate by radar and it is resistant to fungi and corrosion. Its use during wartime would reduce the demand for metals.

Because the plastic mats will float, they can be dropped from cargo ships and towed ashore. They can also serve as surfacing for beach operations.

The T-12 was developed at the U. S. Army Engineers Waterways Experiment Station, Vicksburg, Miss.

Highways of Soft Coal?

The Kentucky State Highway Department has signed a $200,000 contract for a program of research on the use of a highway binder material made from soft coal (ENR June 18, p. 137).

Curtiss-Wright Corp., of Woodridge, N. J., will build a pilot plant that will produce 3,000 gal of binder per day.

Some Ideas

for your file of practical information on surveying from

KEUFFEL & ESSER CO.

An anonymous Persian once said: "Luck is infatuated with the efficient." In line with this bit of good, dry wisdom, we present five items that, in their measure, will step up surveying efficiency . . . by permitting faster work, by promoting greater accuracy, or by doing both. For example . . .

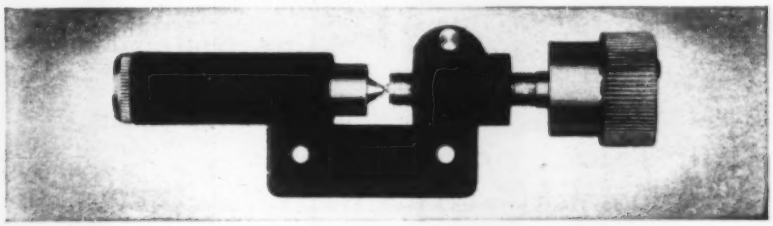
The New K&E Double Right Angle Prism

This simple, hand-held instrument belongs in every surveyor's kit. It bends the line of sight exactly 90° to left and right, so that you can quickly establish a right angle to your position between any two points – without the bother of setting up a transit. This can save you much time and effort when staking out small areas or laying out squares for contouring.

Objects straight ahead can be sighted clearly through a slot in the handle, even when they are at a steep angle above or below your position. Actually, the new Double Right Angle Prism is an improved edition of an earlier K&E model. Tests show that it's much more accurate. The prisms are much larger . . . points are picked up more quickly.

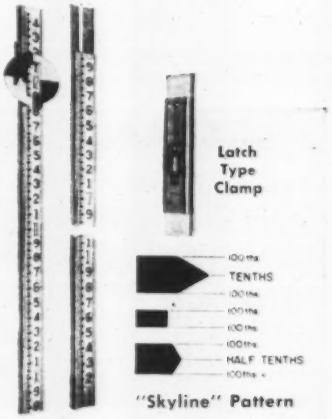
High and Low Gear Tangent Settings

Exact aiming and precise vernier settings are fast, smooth and easy with the new



K&E 2-Speed Tangent Screw. Its two sets of gears control rough adjustments separately, with one screw. Simply by reversing the tangent screw, you swing into "low gear" once the rough sighting has been made. Then, with the screw operating at a slower, finer ratio (4 to 1), you have firm, positive control of final settings. Hesitation and delay are eliminated, with considerable saving of time and temper for the whole field party.

The upper motion of every new K&E PARAGON® Transit is fitted with a 2-Speed Tangent Screw, as standard equipment. The new control may be specified for the other two motions as well. If you already have a PARAGON Transit (not more than 5 years old), you can order these time-savers individually, and install them yourself.



Rigid as a Steel Column

Here are two outstanding K&E features offered by the recently-developed Detroit Leveling Rod. The rod is made in three sections. Each of these is joined by an exclusive locking device – a latch-type clamp on a steel brace, drawing the sections together in rigid contact. When erected to its full 12.5-foot height, the Detroit Rod is as solid as one continuous bar. There is no wobbling or binding at the joints. Even habitual skeptics have called this "a revolutionary advance" over conventional locking methods. Another important feature: the new "Skyline" graduations, developed by K&E to make fast but accurate readings possible at greater distances, with less eyestrain. The distinctive pattern shows tenths of a foot, half tenths and hundredths – sharply on a clean, white background. Every Detroit Rod is furnished with a strong, mildew-resistant canvas bag, partitioned to hold the three sections. The bag is only 4'6" long.

New Tape Thermometer Snubs Air Temperature

On a winter afternoon, when the mercury can drop from a balmy 50° at noon to 20° at 4 pm, a 100 foot steel tape can shrink as much as 1/20 of a foot. A reliable tape thermometer assures accurate measurements by showing actual tape temperature – often 20 to 30° higher or lower than that of the air. K&E designed this new

tape thermometer so that the bulb may be *clamped* tightly against the tape surface. It reports the *tape's* temperature, not the air's. Above-zero readings appear in black, below-zero in red. The instrument complies with rigid Government specifications.

Red and Yellow and Seen All Over

For years, surveyors have protected life, limb and property by painting tripod legs in loud colors. Now, all K&E wide-framed tripods are available *pre-painted* in high-visibility yellow, with a bright red stripe. You can throw away your paint brush!

All these products may be seen and had at your nearest K&E dealer. Stop in and see them. Or simply clip and mail the coupon below . . .

KEUFFEL & ESSER CO., Dept. EN-7, Hoboken, N. J.

I'd like to know more about:

- ☐ K&E Double Right Angle Prism
- ☐ 2-Speed Tangent Screw
- ☐ New K&E Tape Thermometer
- ☐ Detroit Leveling Rod with "Skyline" Graduations
- ☐ New 2-Color Tripods

Name & Title_____

Company & Address_____

_____ 1624

Du Pont Announces the ACUDET® SERIES of Delay Electric Blasting Caps

Greater Dependability and Accuracy

A new series of delay electric blasting caps with accurately spaced delay intervals which eliminates all possibility of overlapping—a major forward step in delay blasting control.

The new Du Pont Acudet® Delay Electric Blasting Caps provide new standards of accuracy and dependability in regular delay blasting. Manufactured to closer timing tolerances than ever before possible, the new series assures positive intervals of $^1/_{10}$ to $^1/_2$ second between each period throughout the entire series of 14 delays.

There are 14 delay periods available in the Acudet series with a total spread of $8^1/_2$ seconds. The timing of each period has been carefully selected in order to provide optimum blasting results.

No arcing failures

The Acudet Series of delays can be fired in series, straight parallel, or parallel series hookups without arcing failures at any voltage commonly used. When the first-period Acudet Delay fires in $^1/_{10}$ of a second and breaks the circuit, damaging arcs do not have time to form. This eliminates the need for a special circuit-breaking cap in the lead line or for expensive special timing equipment with its limitations.

Field experience with Du Pont Acudet Delays has shown the following advantages:

1. More muck per round—less bootleg.
2. No loose powder in the muck pile—increased safety.
3. Easier loading—more uniform fragmentation.
4. Easier to make primers—Acudet Delays are shorter.
5. Corrosion resistant aluminum shells.*

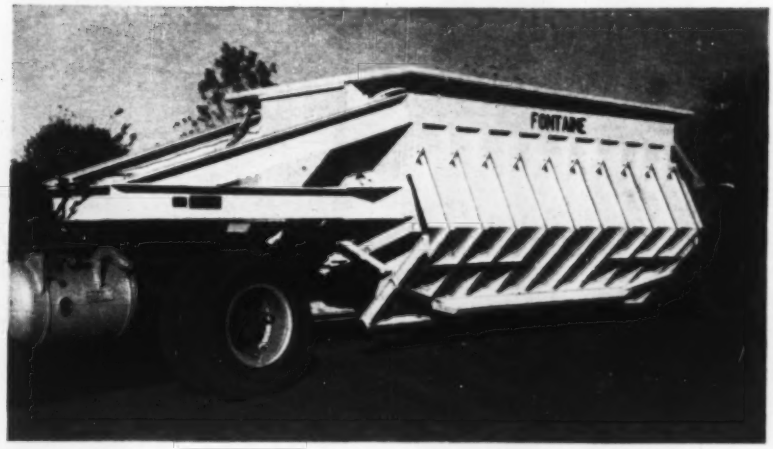
In common with all other Du Pont Electric Blasting Caps, Acudet Delays are mechanically assembled with nylon plastic insulation on the leg wires, rubber plug closures and shielded shunts.

For further information, contact your Du Pont Explosives representative or write to E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

**Copper shells on request*

DU PONT EXPLOSIVES

Better Things for Better Living . . . *through Chemistry*



Trailer Has Hydraulic Control

A 20-cu-yd bottom dump trailer features a dumping action based on a system actuated by double-acting hydraulic cylinders.

The arms that open and close the doors are actuated on a cam that automatically locks the doors in a closed position. This is said to prevent the doors from jostling open when the trailer is in transit.

The inside measurement is 13 ft 8 in. x 7 ft. It is made of ¼-in. steel plate and reinforced with formed and structural beams. Overall length is 27¼ ft. Fontaine Truck Equip. Co., Inc., 1232 37th Place, Birmingham, Ala.

Sealer Has Non-Pulsing Pump

One-pass pressure sealing, direct from kettle to joint, is cited for the Clipper Model AC-40A hot pour joint sealer.

The sealer is equipped with a pump that provides a flow without pulsation for getting the material evenly to joints in highways, air fields and city streets.

Engine and pump are at the rear of the sealer. Thermostat, propane pressure regulator and other instruments are grouped in a steel enclosure on the side of the sealer. Clipper Mfg. Co., 2800 Warwick, Suite 156, Kansas City, Mo.

Corrugated Body Ups Payload

Two rear-dump, off-highway trucks manufactured by International Harvester have corrugated bodies that are said to cut body deadweight by 30% and thus are able to increase payload capacity.

The larger of the two trucks, the Model 95, has a heated body, a struck capacity of 18 cu yd and a 27-ton payload. The smaller Model 65 has a struck capacity of 12.5 cu yd and a 19-ton payload.

Floors, side and front sections are formed of ¾-in. corrugated steel plates. An inverted hoist action on both models permits 11-second dumping. This feature also keeps the pistons clean, the manufacturer states.

Speeds up to 38 mph are obtainable with the Model 95. The Model 65 delivers speeds to 36.46 mph through a 10-speed, constant mesh transmission. Top reverse speed on the Model 95 is 7.1 mph. International Harvester Co., 180 N. Michigan Ave., Chicago.

(*New Products continued p. 82*)

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HYDRAULIC DREDGING
GAHAGAN
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PITTSBURGH: EMPIRE BLDG.
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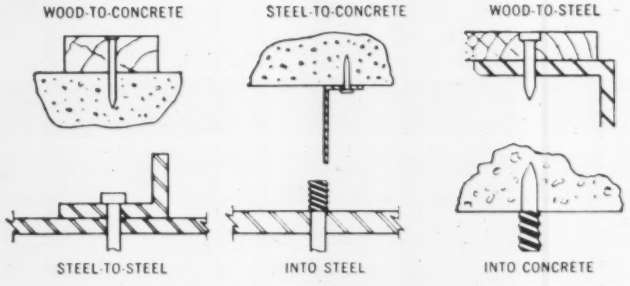
ONLY RAMSET

"covers all the bases in powder-actuated fastening"

This statement has been made by hundreds of contractors, architects, electricians, plumbers, maintenance men, supervisors, foremen and others over the past ten years! Whatever the job, if it involves fastening into concrete or steel Ramset can do it more easily, efficiently, and with a lower in-place fastener cost.

Threaded studs, drive pins, eye pins—over 100 specialized fasteners team with ten types of powder charges to assure you of just the right holding power for each job. It will pay you to get more details. Your Ramset dealer is listed in the Yellow Pages under tools . . . call him today!



In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set® hammer-in tools for light fastening, and Ringblaster® heavy-duty kiln gun.

Ramset® Fastening System

WINCHESTER-WESTERN DIV. • OLIN MATHIESON CHEMICAL CORPORATION
12107G BEREA ROAD • CLEVELAND, OHIO

Lightweight Safety Cap Is Made of Polyethylene

A safety cap of contoured polyethylene, which weighs less than 8 ounces, comes complete with adjustable acetate headband and plastic foam cushion inside the crown.

The cap has an impact resistance in excess of 20 ft-lb. It is designed not as a protection against falling objects, but for technicians and workmen who are subject to head injury in tight working quarters.

It is manufactured in a peaked-cap model only and comes in a full range of colors. Winter liners are available. The polyethylene cap is also available with sound-attenuating equipment. GENTEX CORP., 450 7TH AVE., NEW YORK 1, N. Y.

Electric Hoist Line Has 1- to 25-Ton Range

A line of wire rope, electric hoists with lifting capacities ranging from 2,000 lb to 50,000 lb has been introduced by Harnischfeger Corp.

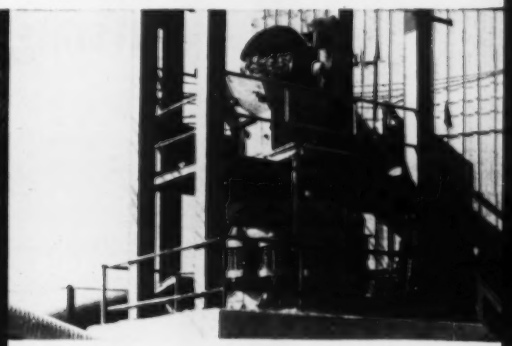
The hoists are equipped with lug, hook, plain, hand-geared or motor driven trolley mountings, with standard or low headroom arrangements, as well as base, wall, ceiling and deck mountings. Powered trolleys may be had with single speed, two speed or variable speed drives. All gearing is heat-treated alloy steel.

Heights of lifts offered range from 15 ft to 100 ft. Lifting speeds, according to model, range from a low of 10 to 20 fpm to a high of 20 to 100 fpm.

Power arrangements include 115-230 volt DC and 220-440-550 volt AC 3 phase 50-60 cycles, with 24 volt operating controls. Motors are available in single, two or variable speed. HARNISCHFEGER CORP., MILWAUKEE 46, WIS.

(New Poducts continued p. 86)

BIG TONNAGES of quality aggregate produced at low cost with SYMONS® Cone Crushers



for STATIONARY service . . . Symons Cone Crushers are built in Standard, Short Head, and Intermediate types, with crushing heads from 22" to 7' in diameter—in capacities ranging to 900 or more tons per hour, for primary, secondary and finer reductions.

for PORTABLE service . . . Symons Cone Crushers are being used in increasing numbers for portable and semiportable crushing plants. Illustrated is a typical Cedarapids® Intermediate Scalping Unit, using a 4-ft. Symons Cone Crusher. Unit is serving a large Midwest sand and gravel producer.

Typical of today's modern highway construction is this view of the modern Freeway in Oakland, California, showing three levels of highway structure over two levels of railroad.
(Photo courtesy California Division of Highways)

C-159

The big tonnages of specification aggregate, bituminous mixes, crushed sand and cement required to meet the ever-increasing needs of the construction industry are produced by Symons Cone Crushers at low cost. Good reasons why these efficient crushers are the leading choice of producers and contractors building highways, dams and hydro projects, bridges, as well as commercial building construction.

It will pay you to specify and use Symons Cone Crushers for both stationary and portable service. *Write for descriptive literature.*

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

NORDBERG MACHINERY

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SYMONS . . . a registered Nordberg trademark known throughout the world

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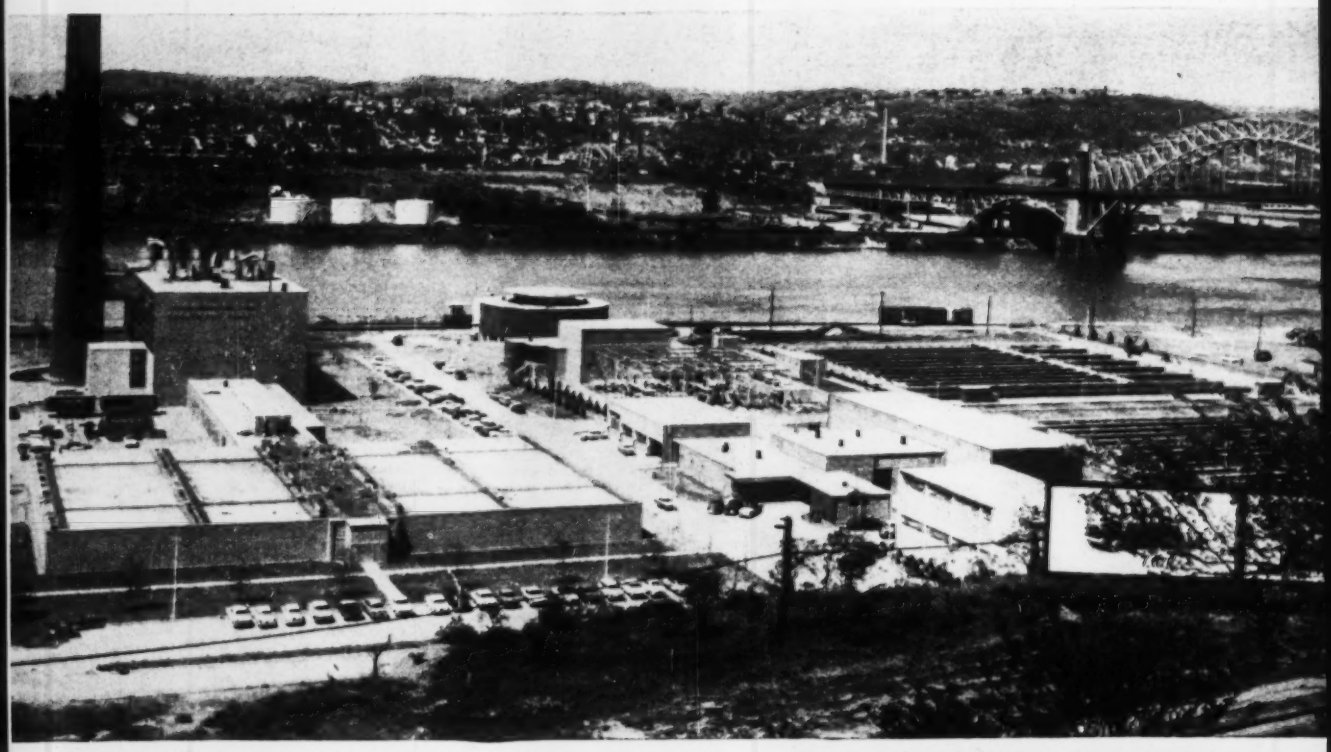
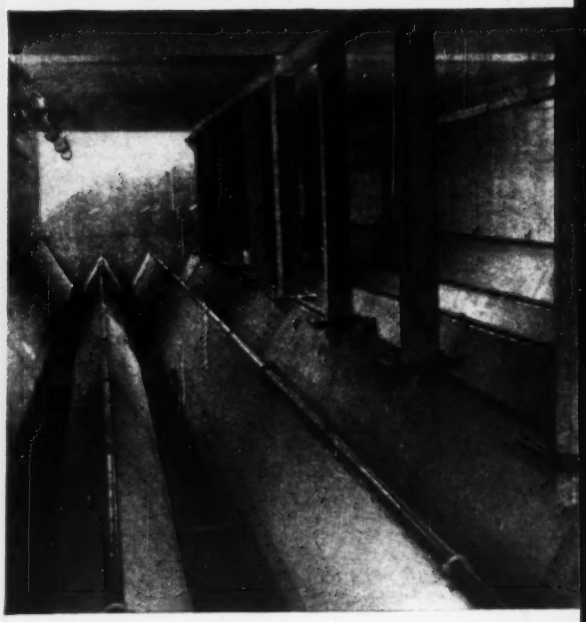
For the entire city of Pittsburgh and 69 surrounding communities . . .

4-D Wrought Iron Pipe handles corrosive wastes



Pittsburgh Sewage Treatment Plant
Joint venture of Allegheny County Sanitary Authority Engineers and Metcalf and Eddy, Consulting Engineers, Boston, Massachusetts.
Installation: Wayne Crouse, Inc., Pittsburgh, Piping and Equipment
Sauer, Inc., Pittsburgh, Plumbing
Layne—New York Co., Inc., Pittsburgh, Downshafts
Architect: Celli-Flynn, McKeesport, Pennsylvania

Final welding on downshafts—Welders here complete transformation of ¾-inch 4-D Wrought Iron plates into 31-inch O.D. pipe. 4-D's self-fluxing action enables welders to easily produce sound, durable welds by any of the accepted welding methods. Elasticity of 4-D Wrought Iron prevents cracking during soil shifts or sudden jars in hauling.



Spray piping for sludge tank—Strung horizontally throughout nine sludge tanks are 270 lengths of 2-inch corrosion-resistant 4-D Wrought Iron Pipe. Spray nozzles, installed one foot apart, are tapped into each pipe run. Nozzles are set on 20-degree angles and aimed parallel to the sloped flush-down weirs.

in new Pittsburgh Sewage Treatment Plant

The new $80 million intercepting sewer and sewage treatment project in the Greater Pittsburgh area is about ready for business.

Built by the Allegheny County Sanitary Authority, the modern system will minimize sewage problems for 69 communities in the Pittsburgh district. The plant will handle 150 million gallons of raw sewage each day. This in turn will greatly reduce pollution in many parts of the Allegheny, Monongahela and Ohio rivers.

4-D WROUGHT IRON IN ALL THESE SERVICES

Hundreds of tons of corrosion-resistant 4-D Wrought Iron are involved in the processing of raw sewage at the new plant. Piping in sludge concentration tanks, chimney vents, tank car connectors and vertical downshafts, as well as force main, effluent, liquid chlorine, compressed air, waste, vent and conduit lines are all 4-D Wrought Iron.

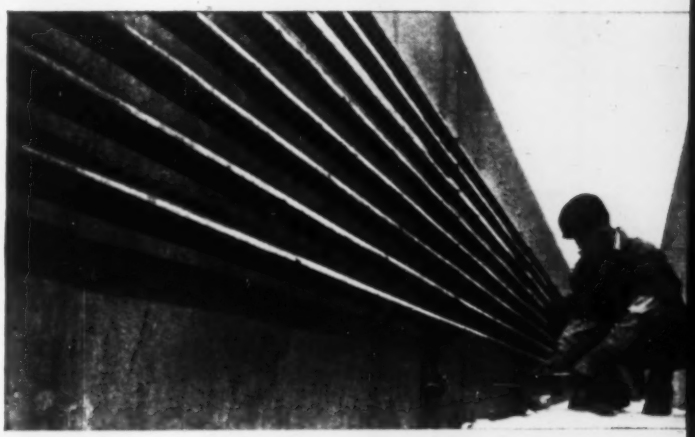
Diameter of the 4-D Wrought Iron Piping ranges from 1-inch to 36-inch O.D.

HERE'S WHY THEY USED 4-D WROUGHT IRON

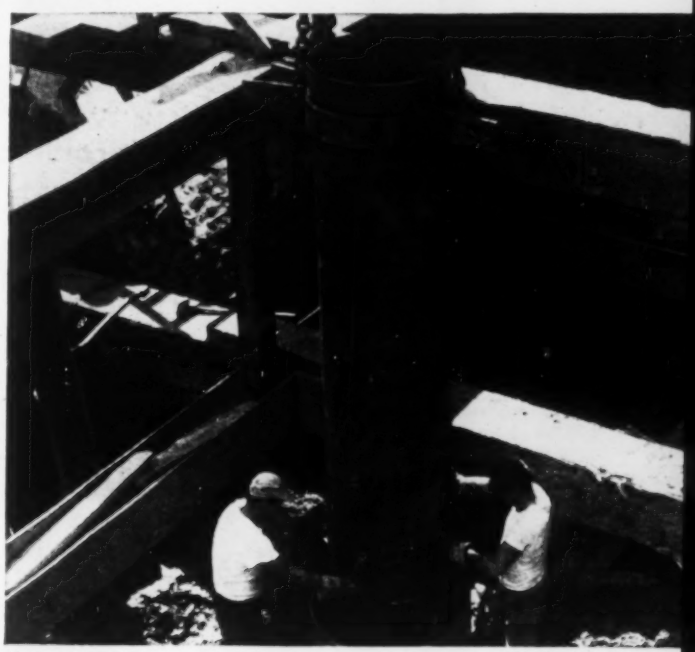
Wrought Iron's record of trouble-free service in demanding applications is well established. 4-D does its own job. Rarely needs costly protective coatings and wrappings. Successfully resists shock and vibration. Inherent elasticity prevents cracking. Long random lengths are available. So, fewer joints are required. Fewer hangers are needed. And 4-D Wrought Iron Pipe does not rely on excessive wall thicknesses to ward off corrosion.

SUMMING UP

Low cost per year of service is the sum and substance of these 4-D virtues. 4-D Wrought Iron lasts. Write for our booklet on sewage treatment and disposal installation. A. M. Byers Co., Clark Bldg., Pittsburgh 22, Pa.



Aligning liquid chlorine lines—One-inch diameter extra-heavy 4-D Wrought Iron Pipe, leading to plant's chlorine room, receives proper alignment prior to final inspection. A service as corrosive as chlorine piping calls for the piping longevity of 4-D Wrought Iron.



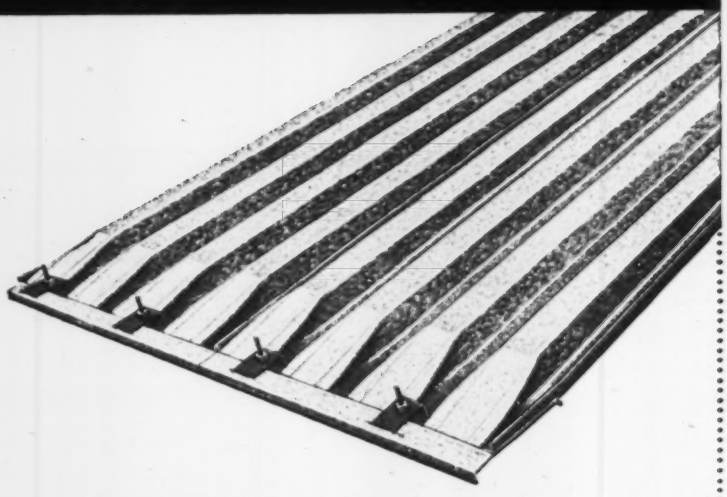
Coffin for corrosion—This 25-inch diameter 4-D Wrought Iron downshaft (¾" wall) spells doom for aggressive elements contained in corrosive raw sewage. 4-D Wrought Iron's unique composition of glasslike iron silicate fibers entrained in pure base metal, blocks corrosion as soon as it starts.

BYERS 4-D WROUGHT IRON

TUBULAR AND FLAT ROLLED PRODUCTS

Corrosion costs you more than Wrought Iron

U.S.F.



$$\frac{w \times t \times r}{\$} + h = F^{USF}$$

Solution to your problem of material waste (w) delays in time schedules (t) removal expense (r) plus hazardous operations (h) suggest the modern, time-saving, labor-saving methods available with USF

"leave-in-place" **STEEL FORMS**

FOR CONCRETE BRIDGE DECKS

Facts, details and complete data sent on request by writing . . .

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UNITED STEEL FABRICATORS, INC.
WOOSTER, OHIO

Highway Guard Rail • Bridge Flooring
Steel Forms for Concrete Bridge Decks
Corrugated Metal Pipe • Window Wells
Metal Doors & Frames • Metal Buildings

One-Man Vibratory Tamper Delivers 2,200-lb Blows

The one-man Stow tamper delivers 2,200-lb blows 2,400 times a minute. It's powered by a 3.8-hp gasoline engine and self-propelled at speeds up to 50 ft per min.

The tamper has an 18-in.-wide shoe; 12- and 24-in. shoes are available. A special 18-in. asphalt water plate is also available.

A 3¼-qt gas tank is placed beneath the engine so that it won't vibrate loose. STOW MFG. CO., 19 SHEAR ST., BINGHAMTON, N. Y.

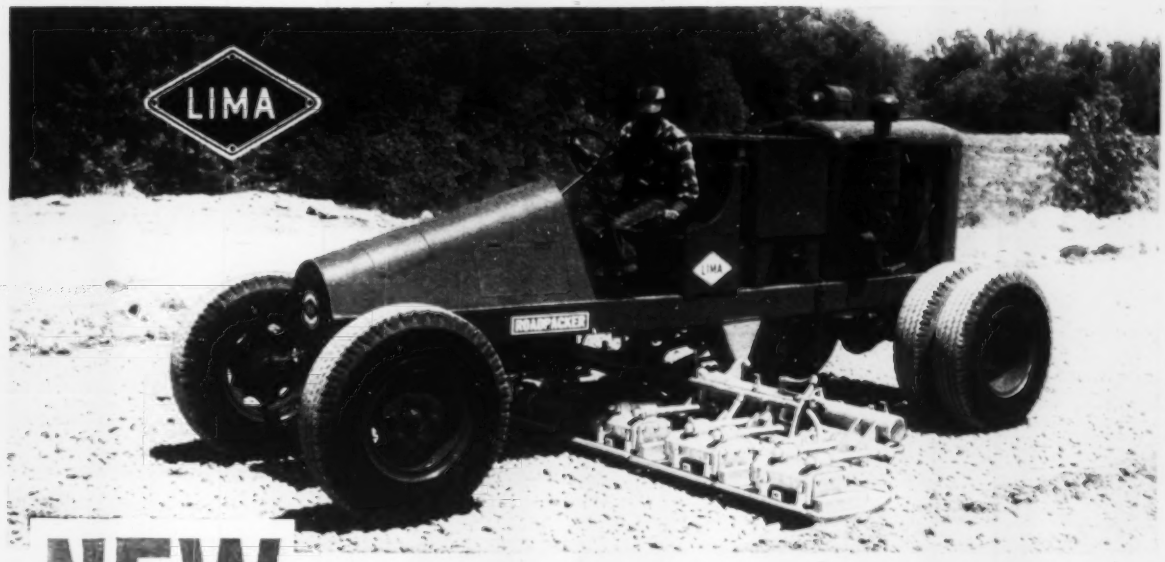
Briefs . . .

• **Refractory material**—"GRB" silicon carbide, a lightweight material with high thermal shock and erosion resistance characteristics that will withstand temperatures above 4500 F and weigh only 2.5 gms per cc. THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

• **Nylon plug anchors**—Available in two types and three sizes, "Tap-It" nylon anchors won't corrode, conduct electricity and are removable and reusable; just drill a hole, without special tools, and tap the anchor tight. ROBERT Q. PARTRIDGE PRODUCTS, INC., 2222 N. W. 10TH AVE., MIAMI, FLA.

• **Steel strap cutter**—A new hand tool, the Model E36 strap cutter will cut steel strapping up to 1¼ in. wide and 0.035 in. thick, yet is small enough to slip in your pocket. ACME STEEL COMPANY, 135 ST. & PERRY AVE., CHICAGO 27, ILL.

(New Products continued p. 88)



NEW LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

Lima Roadpackers meet the challenge — no other vibratory compactor gives you so many cost-saving job-speeding features . . . the reason why Lima Roadpackers are preferred by contractors throughout the world for fast production on highway and airport construction jobs.

Compare these profit-making features!

Heavy Vibrators

Six 437 pound vibrators deliver earth-shaking vibrations for deep, uniform densities. Vibrator units are completely sealed — no external moving parts. Vibrators are self-lubricated and need no daily maintenance. Required densities are quickly achieved. Macadam rock is tightly keyed, with screenings vibrated into voids in only three applications on most jobs. Compacts up to 600 tons per hour.

Infinite Speeds

20 feet per minute to 30 miles per hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control — no gear shifts — no declutching — no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat — engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11" below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

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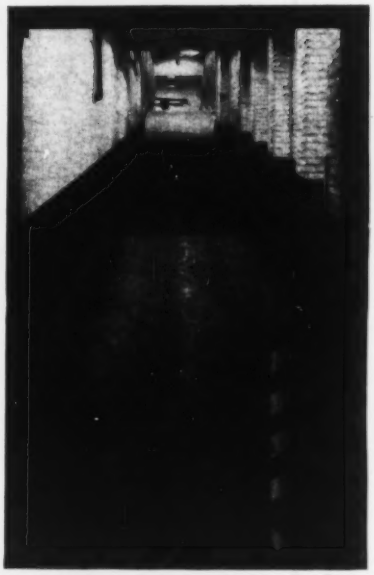
NON-SLIP, DURABLE floors

of ALUNDUM (c.f.) AGGREGATE

Non-skid traction for loaded in-plant vehicles, and long wear, are advantages of the 4-truck cement shipping dock (shown above) of a large New York state company. NORTON ALUNDUM (C.F.) Aggregate was selected for use in the surface finish not only because it provides the very maximum of durability but also a floor that is permanently non-slip even when wet with water and other liquids.

ALUNDUM (C.F.) Aggregate is widely used, both indoors and out, in floors, ramps and stairs in all kinds of structures — both industrial and public. It is definitely the widely accepted answer to the problem of walking and trucking safety plus durability.



Even steep ramps like this are practical when ALUNDUM (C.F.) Aggregate in the cement provides permanent non-slip traction.

Listed in SWEET'S or send for catalog 1935EN.

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ALUNDUM AGGREGATE for Terrazzo and Cement • ALUNDUM STAIR and FLOOR TILE
ALUNDUM and CRYSTOLON Sidewalk Abrasives

. . . New Products

• **Concrete corner forms**—An all-wood form eliminates loose hardware and cuts on-job assembly time. The corner form is 1⅛ in. thick plastic-impregnated plywood with welded steel braces. SIMPLEX FORMS SYSTEM, INC., BOX 85, ROCKFORD, ILL.

• **Multi-fuel engine**—A spark-ignited engine has been designed to operate on a 10:1 compression ratio with methane type gases and on a 7.5:1 ratio with liquefied petroleum or field gases. Known as the D342, it can be converted to diesel operation by changing the pistons and fuel systems. ENGINE DIVISION, CATERPILLAR TRACTOR CO., PEORIA, ILL.

• **Side-mount boom**—A side-mount Chicago boom with a job rated capacity of 1,000 lb has been designed for use with a Buck HoisTower. Easily assembled, it can swing in a 180 deg arc for use on either side of the tower. BUCK EQUIPMENT CO., 720 ANDERSON FERRY ROAD, CINCINNATI 38, OHIO.

• **Hydraulic jib boom**—A hydraulically powered jib boom for use with a Daybrook Power Loader is on the market. It has a 7,000-lb maximum load capacity and a 360 deg rotation. In the horizontal position, the boom has a radius ranging from 7 to 12 ft. DAYBROOK HYDRAULIC DIVISION, YOUNG SPRING & WIRE CORP., BOWLING GREEN, OHIO.

• **Vertical shaft engine**—The Model HAENL heavy-duty, air-cooled vertical shaft engine will operate within a power and speed range from 4.7 hp at 1,600 rpm to 9.2 hp. at 3,600 rpm. Its oil pump is mounted directly on the vertical crankshaft for positive drive. WISCONSIN MOTOR CORP., MILWAUKEE 46, WIS.

• **Asbestos-cement pipe**—Two bigger diameters, 14 in. and 16 in., are now available in K&M asbestos-cement pressure pipe. The larger diameters will be available in four heads—150 ft, 225 ft, 325 ft, and 450 ft. It comes in standard 13-foot lengths plus half and quarter lengths. KEASBEY & MATTISON CO., AMBLER, PA.

• **Aggregate spreader**—A positive feed aggregate spreader, designed particularly for seal coating, controls material flow in either forward or reverse. It comes in six sizes that spread in widths from 8 ft to 13 ft. Known as Model R, it handles all aggregate from sand to crushed rock. HIGHWAY EQUIPMENT CO., 616 D AVENUE, N. W., CEDAR RAPIDS, IOWA.

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in fabrication of Structural Steel

Upper University Avenue Bridge

on Philadelphia's Schuylkill Expressway

Giant fabricated steel girders from INGALLS frame this new Philadelphia bridge. Some weigh up to 144 tons each, with length of 243 feet to a section, and depth at the haunch of 15 feet.

Almost 4000 tons of INGALLS continuous girders, cross girders, stringers and other fabricated structural steel components were used in this important new bridge.

Here is another example of INGALLS skill in fabrication of structural steel. INGALLS complete facilities, long experience, and craftsmanship in both fabrication and erection of structural steel stand ready to serve you on your next construction job. Your inquiry is invited.

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Consulting Engineers: Gannett, Fleming, Corddry & Carpenter

Fabricated Structural Steel: The Ingalls Iron Works Company

Steel Erection: Cornell & Company

STEEL PLATE FABRICATORS ASSOCIATION

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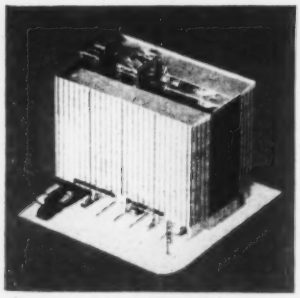
FILE-A-WAY: a parking lot 10 stories high

FIREPROOFED BY SPRAYED "LIMPET" ASBESTOS

Bohman's File-A-Way Parking, 8th & Yamhill Sts., Portland, Oregon. Owner-Operator: L. Bohman, Portland. Architect: Edmundson and Kochendoerfer, Portland. Structural Engineer: R. Evan Kennedy, Portland. General Contractor: A. V. Petersen Co., Portland. Insulating Contractor: Acoustical & Fireproofing Co., Portland and Seattle.



In Portland, Oregon, they've come up with the newest, most modern solution to the downtown parking problems currently plaguing the nation's cities.

It's File-A-Way's system for mechanically parking cars. Here, through push-button control, a car is mounted on a shuttle lift, transported vertically and horizontally as many as ten stories high by elevator, and parked in a pre-determined position—without the attendant ever leaving his post on the elevator. Cars are parked without damage. Valuables can be locked in the car in safety.

Bringing this exciting concept in downtown parking to reality called for modern concepts in design and materials. For example, fireproofing beams and columns with a 1½" coating of SPRAYED "LIMPET" ASBESTOS reduced building costs three ways. Its light weight reduced steel costs. It reduced loss in wastage because it faithfully follows the contours of the surface. Materials costs shrank because only a 1½" coating was necessary. It lowered installation costs and time because one man applies SPRAYED "LIMPET" ASBESTOS with a spray gun in all kinds of weather where temperature is above 40° F.

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Keasbey & Mattison Company • Ambler • Pennsylvania

Gen. Person Retires to Big Job

"The name is Person—no 's'," he says frequently. "I am a very singular fellow."

And "singular" is the word for Brig. Gen. John L. Person, who, after 30 years in uniform as an Army Engineer officer, left the service June 30 to become executive consultant of the Metropolitan Sewer District in Louisville, Ky.

He has a three-year contract calling for a salary of $20,000 a year, making him the highest paid public official in Louisville and Jefferson County.

Although the general is a licensed engineer, his duties at Louisville will be mainly executive and administrative. The five-man board of directors of the MSD created the new post to centralize control of the district. Responsibility for carrying out the board's orders was formerly divided between an engineer consultant and a secretary-treasurer. Both these positions will continue, but the general will be the boss, board members say.

General Person's new assignment is his third in Louisville. He was sent there in 1929, the year he graduated from West Point, to assist in construction of an auxiliary lock at the lower end of the Louisville and Portland Canal. He returned 25 years later as district engineer.

• **The greatest salesman**—Traditionally, railroads and river interests are pictured in the public mind as competitors constantly at each others' throats. Yet a vice-president of one of the nation's top railroads (Louisville & Nashville) paid General Person, then a colonel, perhaps the greatest compliment of his career. The railroad executive termed the general "the greatest salesman in the Corps of Engineers"—on the basis of remarks made by General Person before a Louisville civic meeting.

Perhaps it was informed salesmanship that gave initial impetus to a near-billion-dollar replacement and modernization program for Ohio River navigation dams.

For several years before General Person became Ohio River division engineer in July, 1954, the program was in the doldrums—lot of talk but no action. A few weeks after his arrival on the scene, the Cincinnati Chamber of Commerce had seen fit to name a "Committee of One Hundred" made up of top leaders in business and industry, for the express purpose of persuading Congress to make an immediate start on the 20-year job.

Today, six of 19 major projects in the program are in various stages of construction, each with a main lock 1,200 ft long by 110 ft wide and an auxiliary lock 600 ft long by 110 ft wide.

General Person's interest in the Ohio River and its improvement is something distinctly personal—to a degree that he often refers to it as "my Ohio River." Certainly his long familiarity with it, plus world-wide engineering experience and specific formal schooling, prepared him well not only for the career he is leaving but also for the challenges ahead in Louisville.

Andrew Fischer Jr. Joins Chas. Luckman Associates

Andrew Fischer, Jr., has been retained to direct the expanding construction activities of Charles Luckman Associates, New York and Los Angeles architectural-engineering planning firm.

Mr. Fischer will organize all construction supervision of Luckman projects throughout the Eastern United States, including the Prudential Center, Boston.

Until recently, Mr. Fischer served as a consultant for planning and construction for the Chase-Manhattan Bank headquarters project in New York City.

He is a member of the American Society of Civil Engineers, a trustee of the Building Congress of the City of New York as well as a member of the professional engineering societies of New York and Pennsylvania.

Careers

Business

John J. McFadden, former Chief of Construction at Eggers & Higgins, Architects, New York City, has been appointed an associate of the firm. Mr. McFadden joined E&H in 1949. He received his Civil Engineering Degree from N. Y. U. in 1936 and his professional engineering license in 1937.

Professor G. H. Teletzke has left Purdue University to become director of Sanitary Engineering Research with the Eimco Corporation at Palatine, Ill.

Gordon F. Coates has been appointed manager of the highway division of Mannix Co., Ltd., general contractors of Calgary, Alberta. He worked with the Alberta Department of Highways before joining Mannix in 1951.

Herbert C. Higgins, former engineer of toll facilities of the Washington State Highway Department, has joined the Asphalt Institute as district engineer for Washington and Alaska.

Burrell H. Tripp has been elected president of Taylor & Gaskin, Inc., Detroit steel fabricators. He succeeds **Mervyn G. Gaskin**, who has become chairman of the board of directors.

Kenneth C. Duncan has joined Frost Bros. Construction Co., Indianapolis, as vice president and sales manager.

Cecil E. Story has been elected a vice president and a director of Metzger Construction Corp., Buffalo, N. Y., after 24 years with the company.

Paul Clouse has joined Maddock & Associates Inc., Phoenix, Ariz., consulting engineers, as chief design engineer. He was previously employed by the Maricopa County, Ariz., Highway Department.

Roy Garber has resigned as city engineer of Kettering, Ohio, to join Paul Welch Development Co., contractors in that city. **Valdis Lapsins**, city plan director of Kettering, resigned to join John W. Judge Engineering Co., also of Kettering.

R. K. Gervin, of Vancouver, B. C., has been appointed manager of the Building & Construction Industries Exchange of British Columbia.

George W. Petrie has been elected vice president of Crane & Truck Service, Inc., a subsidiary of Harrison Construction Co., Pittsburgh. At the same time, **Carle M. Davis** was elected vice president of Harrison Construction Co.

Kenneth M. Allen has been appointed chief engineer for Pacific Bridge Co.

E. Frank Heim, of Green Associates, Inc., Baltimore consultants, has been appointed a vice president. **Marshal**

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No more wasted hours in the solution of cut and fill, grade profile, traverse closure, field stakeout, highway alignment. The compact, completely mobile LGP-30 saves time and money in the design of highways, bridges, dams . . . gives you desk-side computation at remarkably low cost.

The large capacity LGP-30 has a memory of 4096 words and is by far the easiest computer to program. Answers are printed out directly – require no deciphering. Self-cooled, the LGP-30 simply plugs into any convenient wall outlet . . . can be operated with only minimum computer experience. Auxiliary high-speed input-output equipment is available for system expansion.

No expensive installation or air-conditioning required. Customer training is free. An extensive library of programs and sub-routines is available—as well as membership in an active users organization. Sales and service facilities maintained coast-to-coast. For further information and specifications, write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. In Canada: The McBee Company, Ltd., 179 Bartley Drive, Toronto 16.

ROYAL MCBEE • *data processing division*

. . . Men and Jobs

McCord, chief civil engineer for the past two years, has been appointed chief engineer of the firm.

Robert J. Boyer has been elected vice president of Hunkin-Conkey Construction Co., Cleveland.

Public Works

Lewis Price, assistant city manager at Valdese, N. C., has been named city manager of Mount Holly, N. C., succeeding **Henry Dunn Jr.**

Lt. Col. Clayton A. Bird, of the Corps of Engineers, has been assigned to Patrick Air Force Base, Cape Canaveral, Fla., as missiles project officer. He will succeed **Lt. Col. John P. Beeson**, who will go to Alaska as engineer of the Yukon Command.

Stearns D. Eason has been promoted by the Washington Highway Department from urban design engineer for the Seattle Freeway to Vancouver district engineer. His predecessor, **William A. Bailey**, is retiring after 45 years with the department.

Fred Krocka has been appointed city engineer and street and sewer superintendent of Shelby, Ohio.

W. A. Wheten has been promoted from deputy city engineer to city engineer of Hamilton, Ontario.

Albert B. Kaltenbach has been named director of public works of Baltimore County, Md.

Philip B. Keasey, former bridge engineer for the Bureau of Public Roads in Portland, Ore., is now Montana division bridge engineer for the Bureau of Public Roads.

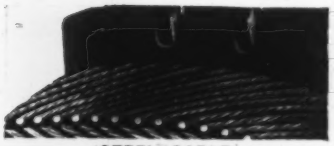
William P. McKenna, of Lisbon, Ohio, will become acting division engineer of Division 11 of the Ohio Department of Highways. He succeeds **John Hagan**, who has become engineer of planning in the central office of the department.

Bernard W. Booker, 67, who retired in May as assistant state highway engineer for California's nine Bay Area counties, has been appointed transportation consultant to the unofficial Alameda County Highway Advisory Committee.

Col. Charles F. Mitchim will become District Engineer for the U. S. Army Corps of Engineers at Chicago next month. He will succeed **Col. John B. W. Corey, Jr.**, who will be assigned to the U. S. Army Engineer Procurement Office, Chicago.

Carl E. Schwob, former chief of the Public Health Service's Division of Water Pollution Control has retired from the PHS for health reasons. Since 1955 Mr. Schwob has been a special consultant to the chief engineer of the PHS Water Pollution Control Program.

(*Men and Jobs continued p. 94*)



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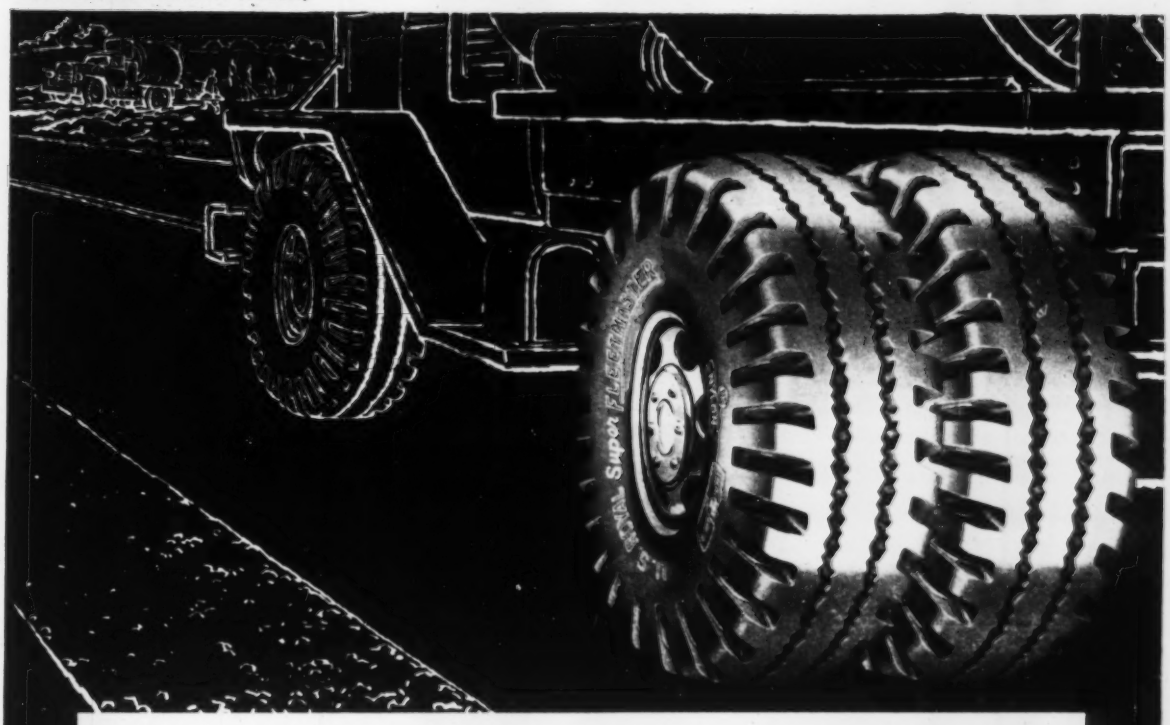

New U.S. Royal Super Fleetmaster gives unmatched Stamina for Speed on the highway... Brute Strength for off-road impacts!

Now you can travel improved roads at full highway speeds, yet have two-way protection against heavy impacts and cutting in off-road service!

Exclusive "U.S." **Safety Steel Shield** puts two layers of tool-hard steel cables between the tread and cord body – forms an impregnable barrier against ruptures, cutting or penetration. Provides permanent protection during life of original tread and all retreads. **Double-Strength Nylon**... twice as strong as the nylon cord used in ordinary heavy-service tires gives utmost protection against impact breaks and blowouts that result in on-the-job delays.

See it for yourself... call your U.S. Royal Dealer today and test a set of these new U.S. Royal Super Fleetmasters – Nylon and Safety Steel Shield.

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. . . Men and Jobs

Robert J. Hajzyk has been named to head the newly-established Planning, Programming and Research Division of the Maryland State Roads Commission. He had previously been chief of the Bureau of Operations of the Baltimore County Department of Public Works.

Howard D. Bessire, director of development and operations for Walla Walla County, Wash., port district for the past 2½ years, has been named director of industrial development for the state of New Mexico.

G. B. Chaires has been promoted to director of highway maintenance of the Maryland State Roads Commission. He succeeds **P. A. Morrison,** who retired recently.

Charles C. Kirkwood has been appointed county engineer of Grays Harbor County, Wash. His father held this same post from 1924 to 1951.

Government

Col. Steven Malevich, now assigned to U. S. Army Europe, will become district engineer for the Army Corps of Engineers at Huntington, W. Va., this summer. He will succeed Col. Herrol J. Skidmore, who will be assigned to the U. S. Army Engineer Center, Fort Belvoir, Va.

Col. Wilber A. Stevens, now commanding the 18th Engineer Brigade at Fort Leonard Wood, Mo., will become district engineer for the Army Corps of Engineers at Savannah, Ga., this summer. He will succeed Col. Robert C. Bahr, who will be assigned in Europe.

Education

Hideo Sasaki has been named Professor of Landscape Architecture in the Harvard Graduate School of Design. A practicing landscape architect in the firm of Sasaki, Walker and Associates, Watertown, Mass., Mr. Sasaki has been an Associate Professor at Harvard since 1956 and is chairman of the Department of Landscape Architecture.

Associations

Donald R. Wadle, managing director of the Metal Lath Manufacturers Association, will resign Sept. 30. He will continue to serve as a consultant to the Association. Jack Fisher, who is currently technical director of the M.L.M.A., will succeed Mr. Wadle.

Harold A. Putnam, president of Putnam-Hawley Building Materials, Inc., and Putnam-Hawley Construction Co., Inc., of Potsdam, N. Y., has been elected president of the Empire State Sand, Gravel and Ready Mix Association.

(*Men and Jobs continued p. 90*)

. . . Men and Jobs

G. Brooks Earnest, president of Fenn College, Cleveland, has been elected president of the Cleveland Engineering Society.

Burnham S. Colburn of Asheville, N. C., has been elected president of the Professional Engineers of North Carolina. He succeeds **T. C. Cooke,** of Durham.

Dan W. Reese, of E. I. du Pont de Nemours & Co., Wilmington, Del., has been elected president of the Delaware Society of Professional Engineers.

Donald H. Lessig, of Warsaw, Ind., was recently installed as president of the Indiana Society of Professional Engineers at the organization's 22nd annual convention.

Frank Myers, of Villanova, Pa., is the new president of the Pennsylvania Society of Professional Engineers.

Honors

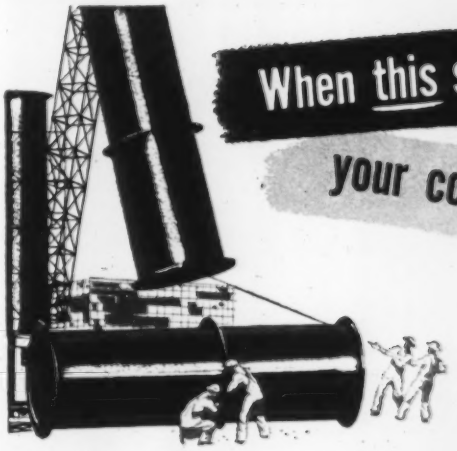
Robert L. Sumwalt, president of the University of South Carolina and former dean of its School of Engineering, has been named South Carolina's Engineer of the Year by the state Society of Professional Engineers.

R. W. Diamond, of Consolidated Mining & Smelting Co., Trail, B. C., **D. A. Keys,** scientific advisor to the president of Atomic Energy of Canada Ltd., Ottawa, **R. A. Spencer,** former dean of engineering at the University of Saskatchewan, **J. B. Stirling,** president of E. G. M. Cape & Co., Montreal construction firm, and **James A. Vance,** of James A. Vance Co., Woodstock, Ontario, have been made honorary members of the Engineering Institute of Canada in recognition of their contribution to the profession.

Harald T. Reishus, construction equipment division vice president of International Harvester Co., has received the plaque of the U. S. Army Engineer School, Ft. Belvoir, Va., for his outstanding contribution to the training programs of the school.

Frank M. Masters, of Masters & Modjeski, Harrisburg, Pa., and **Othmar H. Ammann,** of Ammann & Whitney, New York City, received stainless steel plaques from the Delaware River Port Authority in recognition of their "imaginative concept and consummate skill in the design and construction of the Walt Whitman Bridge" between South Philadelphia, Pa., and Gloucester City, N. J.

James B. Weaver, manager of economic evaluation of Atlas Powder Co., Wilmington, Del., received the 1959 award of merit of the American Association of Cost Engineers for his outstanding work in preparing an annual bibliography of cost engineering articles, books and other publications.



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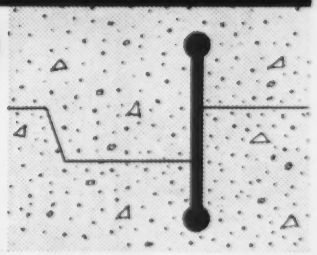

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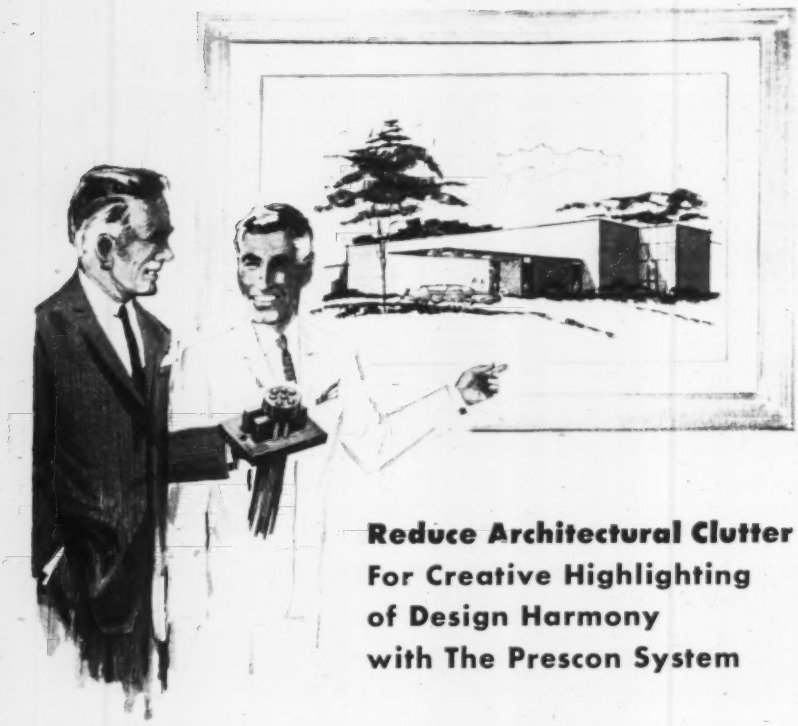

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. . . Men and Jobs

Robert J. Hajzyk has been named to head the newly-established Planning, Programming and Research Division of the Maryland State Roads Commission. He had previously been chief of the Bureau of Operations of the Baltimore County Department of Public Works.

Howard D. Bessire, director of development and operations for Walla Walla County, Wash., port district for the past 2½ years, has been named director of industrial development for the state of New Mexico.

G. B. Chaires has been promoted to director of highway maintenance of the Maryland State Roads Commission. He succeeds **P. A. Morrison,** who retired recently.

Charles C. Kirkwood has been appointed county engineer of Grays Harbor County, Wash. His father held this same post from 1924 to 1951.

Government

Col. Steven Malevich, now assigned to U. S. Army Europe, will become district engineer for the Army Corps of Engineers at Huntington, W. Va., this summer. He will succeed Col. Herrol J. Skidmore, who will be assigned to the U. S. Army Engineer Center, Fort Belvoir, Va.

Col. Wilber A. Stevens, now commanding the 18th Engineer Brigade at Fort Leonard Wood, Mo., will become district engineer for the Army Corps of Engineers at Savannah, Ga., this summer. He will succeed Col. Robert C. Bahr, who will be assigned in Europe.

Education

Hideo Sasaki has been named Professor of Landscape Architecture in the Harvard Graduate School of Design. A practicing landscape architect in the firm of Sasaki, Walker and Associates, Watertown, Mass., Mr. Sasaki has been an Associate Professor at Harvard since 1956 and is chairman of the Department of Landscape Architecture.

Associations

Donald R. Wadle, managing director of the Metal Lath Manufacturers Association, will resign Sept. 30. He will continue to serve as a consultant to the Association. Jack Fisher, who is currently technical director of the M.L.M.A., will succeed Mr. Wadle.

Harold A. Putnam, president of Putnam-Hawley Building Materials, Inc., and Putnam-Hawley Construction Co., Inc., of Potsdam, N. Y., has been elected president of the Empire State Sand, Gravel and Ready Mix Association.

(Men and Jobs continued p. 99)

G. Brooks Earnest, president of Fenn College, Cleveland, has been elected president of the Cleveland Engineering Society.

Burnham S. Colburn of Asheville, N. C., has been elected president of the Professional Engineers of North Carolina. He succeeds **T. C. Cooke**, of Durham.

Dan W. Reese, of E. I. du Pont de Nemours & Co., Wilmington, Del., has been elected president of the Delaware Society of Professional Engineers.

Donald H. Lessig, of Warsaw, Ind., was recently installed as president of the Indiana Society of Professional Engineers at the organization's 22nd annual convention.

Frank Myers, of Villanova, Pa., is the new president of the Pennsylvania Society of Professional Engineers.

Honors

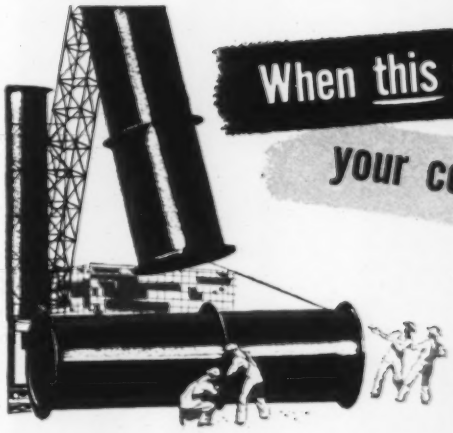
Robert L. Sumwalt, president of the University of South Carolina and former dean of its School of Engineering, has been named South Carolina's Engineer of the Year by the state Society of Professional Engineers.

R. W. Diamond, of Consolidated Mining & Smelting Co., Trail, B. C., **D. A. Keys**, scientific advisor to the president of Atomic Energy of Canada Ltd., Ottawa, **R. A. Spencer**, former dean of engineering at the University of Saskatchewan, **J. B. Stirling**, president of E. G. M. Cape & Co., Montreal construction firm, and **James A. Vance**, of James A. Vance Co., Woodstock, Ontario, have been made honorary members of the Engineering Institute of Canada in recognition of their contribution to the profession.

Harald T. Reishus, construction equipment division vice president of International Harvester Co., has received the plaque of the U. S. Army Engineer School, Ft. Belvoir, Va., for his outstanding contribution to the training programs of the school.

Frank M. Masters, of Masters & Modjeski, Harrisburg, Pa.; and **Othmar H. Ammann**, of Ammann & Whitney, New York City, received stainless steel plaques from the Delaware River Port Authority in recognition of their "imaginative concept and consummate skill in the design and construction of the Walt Whitman Bridge" between South Philadelphia, Pa., and Gloucester City, N. J.

James B. Weaver, manager of economic evaluation of Atlas Powder Co., Wilmington, Del., received the 1959 award of merit of the American Association of Cost Engineers for his outstanding work in preparing an annual bibliography of cost engineering articles, books and other publications.



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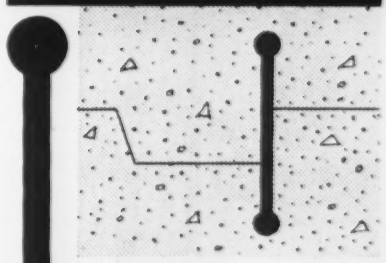

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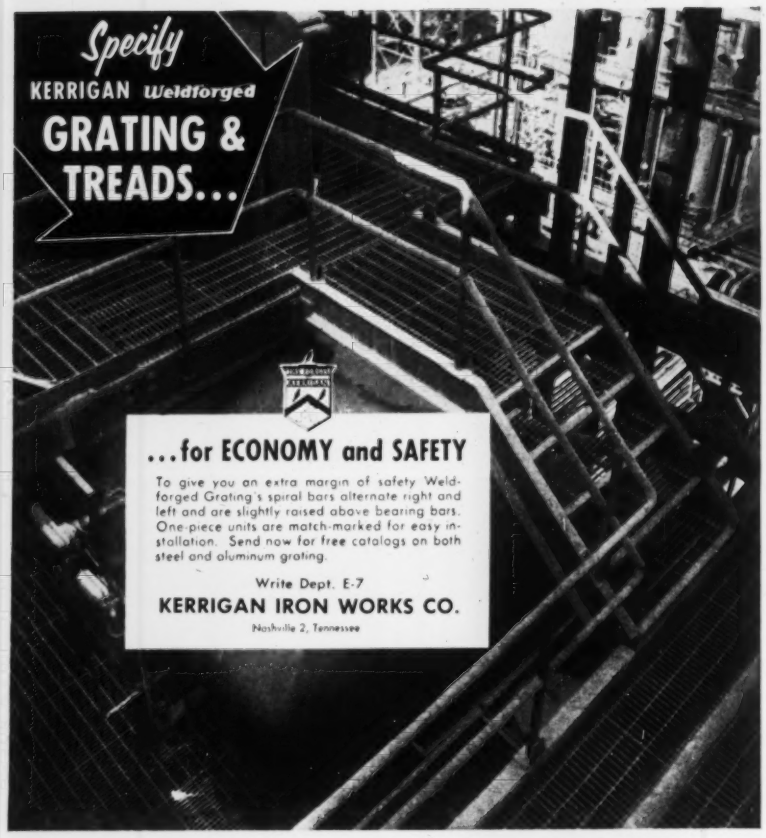
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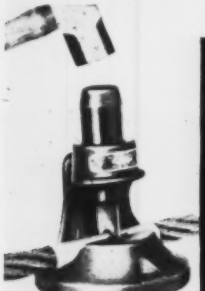

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Obituaries

John R. Giese, 52, member of the firm of Modjeski and Masters, in Harrisburg, Pa. A 1928 graduate of Harvard, his entire professional life had been spent with the consulting firm. He became a partner in 1947.

Henry W. Thome, 51, purchasing agent for the Colorado Department of Highways. He served in the department for 29 years.

J. C. Critcher, Jr., 55, president and owner of J. C. Critcher Inc., of Asheville, N. C., and chairman of the board of Wilkes Engineering Co., of North Wilkesboro, N. C.

James F. Callery, 63, publicity manager of Lone Star Cement Corp. Mr. Callery was one of the earliest licensed professional engineers in the State of Virginia. A native of New York City, he spent 32 years with Lone Star both here and in South America.

Pecos H. Calahan, 73, executive secretary of the Consulting Engineers Association of California in San Francisco. He served for many years as secretary of the California Board of Registration for Civil Engineers. He was the fifth civil engineer registered by the board when the California act went into effect in 1929.

Robert E. Lamb, 77, Philadelphia engineer who founded the firm of Robert E. Lamb, Inc. Mr. Lamb received an engineering degree from Swarthmore College in 1903. He was later on the Swarthmore board of managers for 33 years and on the Friends Central School Committee for 20 years. His firm designed the Lamb-Miller Field House at Swarthmore. The design for the building was exhibited in 1936 at the Paris Exposition.

Joseph Dall, 77, president and last of the third-generation contracting firm of Andrew Dall & Sons, Cleveland.

Arvid Strand, 72, vice president and founder of Strand & Sons, building construction firm, Seattle.

Wesley King, 79, president of Toltz, King, Duvall, Anderson & Associates, St. Paul. Graduated from the University of Minnesota School of Engineering in 1905, Mr. King worked with the American Bridge Co., Minneapolis Steel & Machinery Co. and the Great Northern Railway Co. before joining Toltz, King & Day in 1910.

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What Inspectors Should Know

FIELD INSPECTION OF BUILDING CONSTRUCTION—by Thomas H. McKaig. 337 pages. F. W. Dodge Corp., New York 18, N. Y. $9.35.

There's many a slip between the cup and the lip. And so there is between the drawing up of plans for a building and the owner getting the key to the finished structure. Field inspection is of major importance in keeping slips to a minimum on a building job, but it is a subject often overlooked in college courses and training of architects and engineers. Here is a book that should be invaluable to anyone wishing to do a better job of field inspection.

Based on the author's many years of practical experience, the book is a compilation of recommended procedures and guides. It discusses quality of materials and workmanship, coordination of trades, schedules, material storage, provision of utilities and services and safety precautions. In structure, it follows, for convenience, the sectional organization of "Field Inspector's Check List for Building Construction" (Building Materials and Structures Report 81, National Bureau of Standards, obtainable for 40 cents from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.).

The role of the inspector is placed in perspective in the opening chapter. This also gives good advice on a variety of topics, including the attitude of the inspector toward construction personnel, record keeping and specifications.

Subsequent chapters cover inspecting responsibilities during various construction stages. These chapters give useful descriptions of construction operations and techniques. One chapter is devoted to concrete inspection.

New Versions of Old Reliables

HANDBOOK OF AIR CONDITIONING, HEATING AND VENTILATING—Edited by Clifford STROCK. 1,112 pages. The Industrial Press, 93 Worth St., New York 13, N. Y. $15.

HEATING, VENTILATING, AIR-CONDITIONING GUIDE 1959—37th Edition. American Society of Heating Refrigerating and Air-Conditioning Engineers, 62 Worth St., New York 13, N. Y. $12.

These two reference works are updated, expanded versions of data books that have been in long use by engineers, contractors and others concerned with design, installation and operation of heating and air-conditioning systems. Both books are large-size, about 8x11 in.

Users of Strock's original Engineering Databook will recognize similarities of format and occasional duplication of material. But the new handbook has more than twice as many pages and has been completely updated. It emphasizes working data: tables and charts of engineering solutions predominate. The book contains 518 tables and 598 charts.

The 37th Edition of the Guide, in contrast, consists of a 768-page technical data section and a manufacturers' catalog section of more than 400 pages. New chapters added include High-Temperature Water Systems, Heat Pump, Evaporative Air Cooling and Humidification, and Snow Melting. At least 32 of the 57 chapters in the technical data section have been revised.

Engineering at One Long Glance

ENGINEERING MANUAL—Edited by Robert H. Perry and John H. Perry. 680 pages. McGraw-Hill Book Co., New York, Toronto, London. $9.50.

Prepared by a staff of specialists, this reference work offers in concise form useful data on many phases of engineering. It covers chemical, civil, architectural, electrical, mechanical and nuclear engineering.

The manual also has a section on mathematics and one consisting of mathematical tables—logarithms, trigonometric functions, compound interest factors, to mention only a few. And there is also a section presenting physical and chemical data, such as specific heats, thermal conductivities, steam tables, viscosities and linear and cubical expansion.

In general, the authors have done a fine job in selecting material, considering the difficulty of condensing almost all of engineering into 680 pages. Architects and engineers who occasionally work outside their specialty will find it a valuable addition to their library.

(*Books continued p. 104*)

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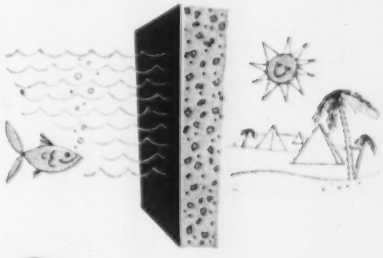

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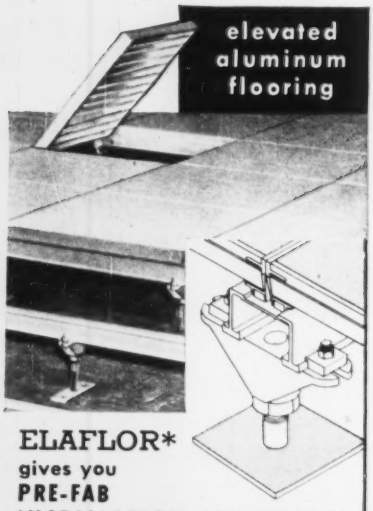

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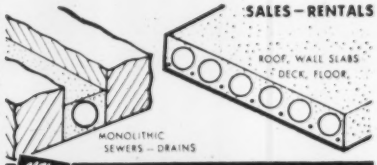

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Design of HTW Heating

HIGH TEMPERATURE WATER SYSTEMS—By Owen S. Lieberg. 211 pages. The Industrial Press, New York 13, N. Y. $6.50.

High-temperature water has become increasingly popular in recent years for heating buildings. The author claims: "Direct use of HTW for space heating is the most economical, the simplest and most satisfactory form of heating." This book points out the advantages and limitations of HTW systems and shows how to design such systems.

HTW is defined as water above 300F. To prevent the water from turning to steam at this temperature, it is kept under a pressure of at least 55 psig. Since most industrial plants operate with 150 to 160-psig steam, HTW systems usually are designed for temperatures around 375F.

The HTW is taken from below the water level in a boiler or expansion tank, pumped to the farthest point of the system and then returned to the boiler. For space heating, the system can employ finned-tube convectors, radiators, radiant panels, unit heaters and air-conditioning reheat coils.

The book should be useful not only to heating designers, but also to contractors, plant engineers, and architects and engineers who may be called on to evaluate the economics, advantages and disadvantages of heating systems.

A Preview for Students

YOUR FUTURE IN CIVIL ENGINEERING BY THE COMMITTEE ON ENGINEERING EDUCATION. 16 pages. American Society of Civil Engineers, 33 West 39th St., New York 18, N. Y. Free.

This booklet is prepared to acquaint the college freshman or sophomore with the various phases of civil engineering activity and the requirements and rewards of the field. Particular emphasis is given to the role of the civil engineer in management and co-ordination of large construction projects.

Water Works Management

A TRAINING COURSE IN WATER UTILITY MANAGEMENT—188 pages. American Water Works Association, 2 Park Avenue, New York 16, N. Y. $2.

Designed as a text for management training courses, this book can also serve as a guide for those already in managerial positions. The 22 chapters cover topics including rate schedules, office operation, accounting, service regulations, legal responsibility and financing. It is the first in a projected series of manuals being prepared by the AWWA.

Here's Who's Who

WHO'S WHO IN ENGINEERING—Edited by Winfield Scott Downs and Edward N. Dodge. 2,899 pages. Lewis Historical Publishing Co., Inc., New York, N. Y.

The backgrounds, educations, experiences and occupations of more than 18,000 engineers from the United States and other nations are carried in the eighth edition of this reference work. In addition to an alphabetical listing, the book contains a geographical breakdown. A directory of engineering groups on state and national levels is also included.

Brief Reviews . . .

• **Parking lot design**—Forty page booklet entitled "How to Lay Out a Parking Lot," developed to help city officials, shopping centers, colleges, industrial firms and others to provide maximum parking with minimum congestion for a given area. Tables and charts give recommended widths and depths of stalls, and other parking lot dimensions for various angles of parking from zero to 90 deg. Diagrams and photographs illustrate a variety of arrangements for both perimeter and island parking. The booklet also describes various types of parking lot equipment including automatic barrier gates actuated by keys, coins or tokens, as well as various types of bump barriers and dividing equipment. Copies are $1.00 each. Western Industries, Inc., 2742 West 36th Place, Chicago 32, Ill.

• **Box-culvert hydraulics**—The first half of this 34-page study treats elementary hydraulics. The remainder is devoted to box culverts. The report includes three slope conditions—mild, steep and discontinuous—and three inlet conditions—unsubmerged, partially submerged and fully submerged. Bulletin 38, Studies in Engineering. By Donald E. Metzler and Hunter Rouse. State University of Iowa. $1.

• **French construction equipment**—The nearly 400 firms making up the Syndicat National des Industries d'Equipment have prepared a 600-page catalog of the equipment they manufacture for construction and industry in general. Price 4800 fr. from the Syndicat, 10 Ave. Hoche, Paris.

• **Dutch metal products**—Available free of charge from the Association of Metalworking Industries, 13 Nassaulaan, The Hague, Holland, is its 1958 Product Book listing the products of most of the country's metalworking companies. In four languages, including English, it contains over 300 pages.

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✻ **Horncure 50:** Wax Resin Base Compound guaranteed to comply with Navy Specifications No. 13yd and NAV docks Typical Specification Jib., Jul. 1945, Addendum #1, Mar. 1951; plus American Assn. of State Hwy. Officials Specification AA-540-148.

✻ **Horncure 60:** Wax Resin Base Compound guaranteed to meet most municipal specifications.

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For condensed data, see Sweet's; or, write to Dept. H13-441 for the new 4-page Horncure catalog.

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Truck, Crane Throughout — & Barge Rigs The U.S.A.

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LINING, ENCASING, FIREPROOFING, REPAIRING

Send for our new bulletin No. 20 of actual photographs, information and detailed specifications.

GUNITE CONCRETE & CONST. CO.
1301 WOODSWETHER RD. KANSAS CITY 5, MO.
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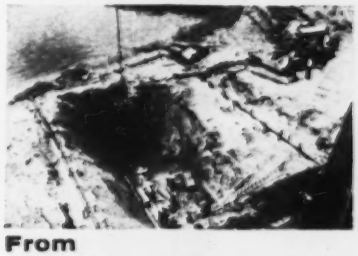
GOT THIS?
(Dewatering Problem)

GET THIS!
(Skilled Wellpoint Engineering)



From
GRIFFIN
WELLPOINT CORP.
SALES • RENTAL • CONTRACT
881 E. 141st St., New York 54, N.Y.
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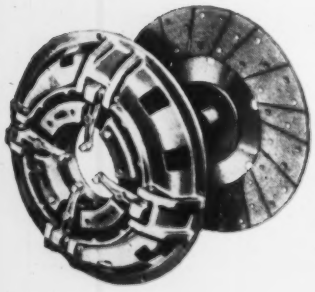
Get Long-Time Positive Action with LIPE TC

Constant Capacity Clutch

Full torque capacity for the entire life of the friction material! The TC non-adjustable, spring loaded, dry-plate clutch compensates for fading pressure of expanding springs. The toggle linkage maintains full pressure . . . smooth, chatter-free engagement.

A massive plate, finned for rapid radiation, is cooled by effective currents of air, preserving friction material. Inner cooling protects chrome silicon springs from overheating, loss of temper.

Simple to maintain: No expensive tear downs for part replacement. Automatically compensated pressure eliminates frequent adjustments: Less down time, longer life and lower overall cost per hour. That's why . . . *the trend is to* LIPE!



● *Write for full information on Lipe TC Clutches. Available in 15½" and 17" single- and two-plate types—torque capacity range of 400 to 4000 ft.-lbs.*

Lipe-ROLLWAY CORPORATION SYRACUSE 1, N. Y.

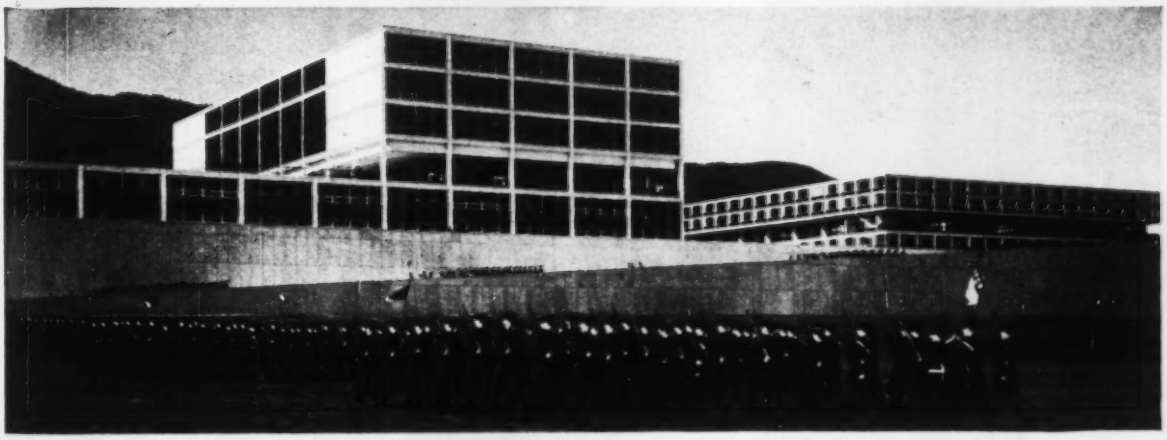
27,000 feet of heat...

Here, at the U. S. Air Force Academy, near Colorado Springs, Colorado, the most modern equipment in the world has been used to provide for the comfort and safety of America's future sky-generals. For instance, a huge radiant heating installation, featuring almost 27,000 feet of ¾-inch USS National Steel Pipe, serves the Cadet Quarters Complex.

For installations such as the Air Force Academy, architects and contractors consistently look to USS National Pipe. As a matter of fact, they've been specifying National for more than 60 years for conventional plumbing and heating systems. It makes sense, too! You know why? Because National Pipe has the qualities to meet the requirements of these applications . . . smooth, uniform bending . . . sound, strong welding . . . and long service life. These qualities have made USS National Pipe the largest selling pipe in the world. For more information, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS and National are registered trademarks

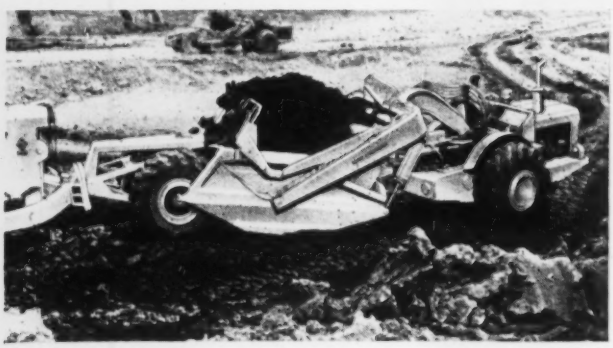
The world's largest and most experienced manufacturer of tubular products



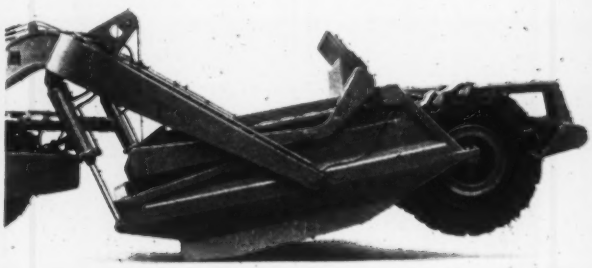
USS **National Tube Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

The TS-260 has powered its way into leadership...



The TS-260's 230 horsepower provides more than 18 horsepower per struck yard... 30,000 pounds of rimpull at 1.9 mph.



The TS-260 is the only scraper in its class to offer positive down pressure on the cutting edge for fast, easy penetration into hard-packed materials.

...move ahead with

THE ALLIS-CHALMERS TS-260

Eats Up Big Yardage Faster than Anything in its Class

All over America, the 17-cu-yd TS-260 in action is convincing construction men that here's the top dirt hog in the medium-sized motor scraper field. It'll convince you, too—with its profit edge in horsepower, rimpull and exclusive positive penetration at the cutting edge.

One of the most commanding features of the TS-260 is its new Allis-Chalmers 16000 engine. This big, new power package delivers 230 horsepower at 2,000 rpm . . . more than 18 horsepower per struck yard of capacity . . . up to 12 percent more than most other units of comparable size. The 16000 engine also offers unmatched efficiency and fuel economy—result of controlled turbulence produced by a combustion system unique in the construction machinery field. There's over 30,000 pounds of rimpull in low gear . . . up to 25 percent more pull than others in the 15-yard class at normal loading speeds.

Only Allis-Chalmers offers positive hydraulic down pressure on the cutting edge. In the loading cycle, this means fast, easy penetration even into hard-packed material for big 17-cu-yd loads. Double-acting scraper jacks also provide full power for rapid lifting of loaded scraper bowl. Result—faster getaways for loaded scrapers, faster work cycles.

When the ground gets soft or muddy, KON-TORK differential automatically goes to work *shifting power from the wheel that slips to the wheel that grips* . . . enables the TS-260 to walk right through axle-deep mud if it has to. KON-TORK differential also permits normal steering and complete control of the unit when varying torque is being delivered to drive wheels.

The TS-260 is loaded with other important performance and production advantages, too. Original, low, wide bowl with curved bottom reduces loading resistance . . . speeds loading cycles. Smooth 90-degree turning ability permits 180-degree turns in less than 31 ft . . . an air-actuated transmission brake lets operators upshift swiftly and surely without double clutching.

Your Allis-Chalmers dealer will be glad to show you all of the high-performance features on the TS-260 . . . and to prove their worth in an actual demonstration on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wis.

in performance, dependability, profit for its owners

When the going gets tough, KON-TORK differential automatically shifts power from the wheel that slips to the wheel that grips . . . keeps the TS-260 moving through the muddiest going.

KON-TORK is an Allis-Chalmers trademark.

ALLIS-CHALMERS... power for a growing world

indoors and out

steel pipe

sprinkler systems afford constant protection

In a modern department store like Camden's Lit Brothers, the presence of a dependable *steel pipe* sprinkler system can spell the difference between a hundred dollar "nuisance" fire and a million dollar holocaust. That's why there is a tremendous upsurge of interest today in the installation of sturdy, low-cost *steel pipe* fire protection systems. And *they* pay for themselves in reduced insurance rates.

On our country's leading golf courses, too, economical *steel pipe* sprinkler systems keep the greens from turning brown. Public parks and private grounds are getting the same protection from the burning summer sun. It's another example of the many kinds of jobs that *steel pipe* can do *best*.

STEEL PIPE IS FIRST CHOICE

- Low cost with durability
- Strength unexcelled for safety
- Formable—bends readily
- Weldable—easily, strongly
- Threads smoothly, cleanly
- Sound joints, welded or coupled
- Grades, finishes for all purposes
- Available everywhere from stock

INSIST ON PIPE MADE IN U.S.A.

COMMITTEE ON STEEL PIPE RESEARCH
AMERICAN IRON AND STEEL INSTITUTE
150 East Forty-Second Street, New York 17, N.Y.

Ohio River Lock to Replace Four

Use of existing cofferdam requires paying for pumping unpredictable amount of seepage

All contractors on this New Richmond Locks and Dam project on the Ohio River near Chilo, Ohio, for the Corps of Engineers, Huntington District, W. Va., elected out of four cement alternates, one that called for portland cement blended with fly ash.

No bids were based on portland cement alone, a combination of portland and natural cements, or portland blast furnace slag cement. S. J. Groves & Sons Co., New York City, took the award on a low bid of $25,216,379. This was 11.2% above the engineers' profit-not-included estimate.

The work involves the construction of a main lock chamber 110 ft wide and 1,200 ft long, an auxiliary lock chamber 110 ft wide and 600 ft long, with appurtenant structures. These new structures will replace four obsolete low level, undersized locks. The job will require unwatering; maintaining and removing the existing cofferdam; lock filling and emptying systems; a hydraulic system; compressed air and water system piping; electrical trays; embedded conduit; light standards; two gaging stations; an operations building, miter gates and operating machinery; driving steel sheet and steel bearing piling for guard and guide walls; an access road with two 132-in.-dia multiplate pipe culverts; four control station shelters; trestles and anchorages; 24 floating mooring bitts; culvert valves and operating machinery; cathodic protection for the miter gates; and related work.

Steel sheet piling for the cofferdam cells can be driven only to the top layer of boulders, four to seven ft thick, which is embedded in sand and gravel and underlies the rock. To protect both the government and the contractor, the unit price bids are set up to pay for pumping to allow for substantial seepage expected to pass under the cells. The amount of this cannot be estimated until the cofferdam is unwatered.

Minimum wages include: carpenter $3.575; electrician $3.82; structural ironworker, $3.60; crane, power shovel, air compressor and piledriving machine operators, $3.60; bulldozer operator, $3.375; common laborer, $2.475.

The bidding on this waterway job included:

1C S. J. Groves & Sons Co., N.Y.C.	$25,216,379
2 Potashnick Constr. Co. Inc., Cape Girardeau, Mo.; Traylor Bros., Inc., Evansville, Ind.; and H. D. Tousley Co., Inc., Indianapolis, Ind., a jt venture	25,472,684
6 Dravo Corp., Neville Isl., Pittsburgh, Pa.	27,178,024
EE *Corps of Engineers, Huntington, W. Va.	22,671,094

* Exclusive of profit

Bids: 3-5-59 Items	Unit	Quantity	Unit Prices 1C	2
Test grtg, mobil & demobil, incl grt pipes	ls	job	$6,300	$17,800
grout pipes	lf	4,000	3.00	3.70
grout connections	ea	100	5.00	5.00
portland cement	bbl	1,250	6.80	8.40
placing grout	bag	5,000	2.30	2.85
Pumping facilities, 25,000 gpm cap f&i	ls	job	75,474	900,000
5,000 gpm i	ea	3	1,370	5,000
add at job site f	ea	3	11,700	8,000
25,000 gpm operate	day	140	158.00	270.00
10,000 gpm operate	day	750	132.00	135.00
5,000 gpm operate	day	600	123.00	135.00
Cofferdam maintenance	ls	job	112,750	20,000
removal	ls	job	795,270	420,000
Exc, com, inside cofferdam, outside cofferdam,	cy	341,300	1.19	0.80
above elev 458	cy	126,100	0.74	0.60
below elev 458	cy	447,000	1.17	0.80
over 447,000 cy	cy	260,000	0.95	0.46
inside guard wall cells	cy	6,020	8.26	2.00
rock	cy	1,440	14.24	40.00
Line drilling	sf	2,510	3.55	2.50
Topsoil	sy	84,440	0.91	0.25
Fill	cy	283,100	0.50	0.50
Clear for locks	ls	job	12,000	2,000
Drain, perf pipe, 15"	lf	1,050	11.70	9.00
Piling, stl brg, vertical cofferdam guard walls, inside	lf	10,300	9.80	11.30
outside	lf	34,810	11.00	11.70
upper guide wall	lf	9,630	10.20	11.00
Piling, stl brg, batter, upper guide wall	lf	7,410	11.75	12.24
Piles, H-beam pull	lf	500	18.10	4.00
redriv	lf	500	18.10	3.00
Piling, inside cofferdam, stl sht, vertical	lf	30,330	4.56	4.40
batter	lf	16,350	4.55	5.50
tees	lf	150	11.85	13.00
outside, steel sheet	lf	129,980	6.35	5.50
stl sheet tees	lf	4,140	13.25	14.25
Conc, walls & sills	cy	579,700	17.45	17.19
laterals, culverts, outside structs, etc	cy	25,440	33.95	31.00
2nd & 3rd pours	cy	920	17.65	74.00
upper grd wall, monoliths R-66 R-85, above elev 470	cy	20,000	29.40	19.60
upper gard wall cells, mono R-67 R-95, below elev 470	cy	12,450	11.50	14.70
lower grd walls, monolith R-1 R-20, above elev 452	cy	24,100	25.00	19.25
below elev 452	cy	7,640	11.80	15.00
Steel reinforcement	lb	7,168,200	0.16	0.14
fabric	lb	89,450	0.21	0.18
Rubber waterstops	lf	2,500	1.58	8.00
2-leaf miter gates & embedded metals, upper	ea	2	333,784	360,000
lower	ea	2	324,130	350,000
Culv valv & embedded met	ea	6	32,878	40,000
Steel, struct	lb	3,475,000	0.235	0.24
castings	lb	2,900	0.58	1.00
Check posts	ea	68	113.65	100.00
Ring bolts	ea	2	50.00	60.00
Line hooks in conc wall	ea	426	92.36	100.00
on upper guard wall cells	ea	21	77.95	60.00
Pipe handrailing	ls	job	5,597	5,500
Guard rail	ls	job	30,103	33,000
Floating mooring bitt	ea	24	5,138	6,500
Steel gages	ls	job	1,900	1,800
Culv bulkhd & pickup assembly	ea	4	6,750	9,100
Auxiliary pickup line	ea	2	100.00	360.00
Seal diaphs & embedded met for bulkhead recesses at culv vlvs	ls	job	63,277	137,000
Alum grating & fl plates	ls	job	66,702	120,000
Misc piping & apputt	ls	job	21,025	30,000
Gaging Station A	ls	job	21,800	17,500
Station B	ls	job	10,473	14,700
CI frames & covers	ls	job	7,812	8,300
Embedded metals for lock emer gate recesses	ls	job	57,890	109,000
downstr bulkhd recesses	ls	job	7,678	5,300
Screens & nose plates at intake manifolds	ls	job	38,152	53,000
Control station shelter	ea	4	2,450	5,400
Poiree trestles & anchors	ls	job	25,649	33,500
Bulkhd storage platform walkwy & embed metals	ls	job	8,683	13,000
Piezometer	ea	12	225.00	300.00
Col supt, lock lateral	lf	840	7.95	11.50
Operations building	ls	job	75,368	160,000
Mobil & demobil for drill & grouting	ls	job	2,000	2,500
Grout holes drill	lf	5,230	2.40	3.00
connections	ea	210	5.00	5.00
Portland cmt for grout	bbl	655	6.80	6.20
Grout place	bag	2,620	2.00	2.50
Explor holes, 3" NX, drill	lf	600	6.50	8.00
Clear & grub, access road	ls	job	2,910	800.00
Stripping, access road	cy	5,500	1.11	0.70
Embankment, access road	cy	44,480	0.14	0.70
Dumped riprap	cy	980	8.00	21.00
Guard rail, access road	lf	2,130	2.63	3.60
Culv pipe, 15" multiplate pipe, 132"	lf	120	6.70	6.50
	lf	480	123.00	200.00
Mac base crse, dry bound	t	4,250	5.80	5.30
Bit prime coat	gal	2,050	0.35	0.25
Bit surf treat, dbl aggr	t	220	7.50	5.90
bituminous material	gal	4,640	0.25	0.25
Road oil	gal	15,200	0.30	0.20
Hydraulic system	ls	job	355,000	300,000
Miter gate oper machinery & embedded metals	ea	8	37,296	37,000
Culv vlv oper machinery & embedded metals	ea	6	39,774	36,000
Compress air piping syst	ls	job	4,200	15,000
Raw water piping syst	ls	job	22,000	25,000
Potable water system	ls	job	2,600	6,600
Fuel oil piping system	ls	job	2,885	4,000
Electrical work	ls	job	244,750	340,000
Cathodic protect, miter gates	ls	job	81,800	65,000
Portland cement	bbl	554,385	4.37	4.84
Fly ash	t	29,567	3.85	5.53

f Furnish f&i Furnish & instal i Instal
Completion schedule: 900 cal days
Liquidated damages: $1,000 cal day

N. J. Highway Prices

1957 and 1958 weighted average contract prices, selected items

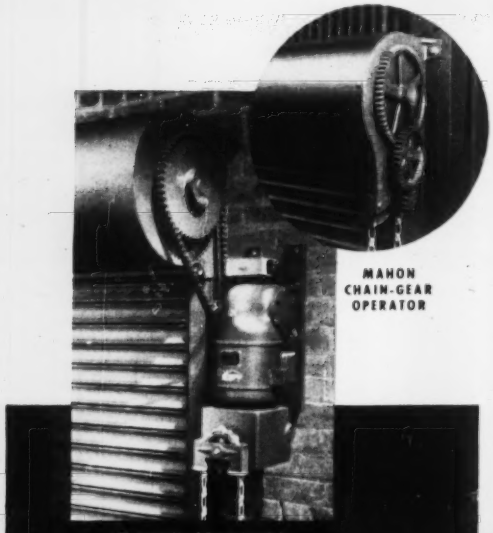
Items	Unit	Avg Unit Prices 1957	1958
Exc, incl dispose of matl, rdwy earth	cy	$0.58	$0.76
rock	cy	2.23	1.32
uncl	cy	0.77	1.11
wet	cy	0.92	0.85
channel	cy	1.12	1.03
ditch	cy	1.33	1.72
borrow, incl place & compact	cy	0.94	0.89
Subbase, incl placement & compaction	cy	2.17	2.19
Gravel shoulders, 6"	sy	1.36	..
Topsoil, 4", incl pl, fert, seed & smooth	sy	0.38	0.29
Riprap slope protection	sy	10.32	6.69
Base crse, 6" grav, furn, compact, shape	sy	0.43	0.44
7" mac, furn, place, add screenings, vibeate & roll	sy	1.71	1.66
8" conc, incl subgr, furn & place, strike surface	sy	5.28	7.03
6" stn furn, pl, add screenings, vibrate & roll	sy	1.47	1.32
Intercourse, penet macadam, 3"	sy	0.920	0.870
Pave, med aggr bit conc, 3", incl roll	sy	1.590	1.590
conc surf, excl subgr prep & exp jts, 8"	sy	6.98	6.82
reinf, 9"	sy	6.35	6.35
Conc, cl C, walls, steps, etc, incl forms	cy	93.00	97.79
RCP culv, std str, 18"	lf	5.88a	6.41a
36"	lf	14.52a	15.29a
CIP culv pipe, ext heavy, 12"	lf	8.47a	8.51a
18"	lf	16.07a	16.05a
CMP, perf, 6"	lf	2.93a	3.05a
culvert, 12"	lf	5.49a	6.05a
24"	lf	10.29a	9.64a
72"	lf	40.00a	37.56a
MH, 8' deep, incl head, exc & bkfl	ea	293.00	283.63
Conc gutter & aprons, 6"	sy	6.79	7.43
white, vert curb, 9x17 avg, incl excavation & forms	lf	2.58	2.53
Conc sidewalk, 4"	sy	1.71	1.60
Guard rail, std beam, incl painting	lf	3.30	2.81
W. I. pipe conduit, electric, 2"	lf	3.20	3.15

units x price
Total units = wgted avg price

a All pipe items include excavation of trench & backfill
b Exclude bituminous binder material
c Include placement & compaction

ROLLING STEEL DOORS

Manually, Mechanically, or Electrically Operated



MAHON CHAIN-GEAR OPERATOR

MAHON STANDARD POWER OPERATOR 920-P

The adaptability of Rolling Steel Doors to unusual openings is only one of their many outstanding advantages. In the 48'-5" x 15'-6" loading dock openings shown below, no other type of door could meet the requirements. The vertical roll-up action of Mahon Rolling Steel Doors requires no usable space either inside or outside the opening—no headroom restrictions. The all-metal construction gives you the permanence of Bonderite-protected galvanized steel . . . maintenance is minimal; and, in steel, you get maximum protection against intrusion and fire. No other type of door provides all of these important features which are so essential for functional efficiency in busy doorways today. When you are ready to buy a rolling steel door, check specifications carefully . . . you'll find, through comparison, that Mahon Rolling Steel Doors are built better to give you better service over a longer period of time. See Sweet's Files for complete information, including Specifications, or write for Mahon Catalogue G-59.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

Manufacturers of Rolling Steel Doors, Grilles, and Automatic Underwriters' Labeled Rolling Steel Fire Doors and Fire Shutters; Underwriters' Rated Metalclad Fire Walls, Insulated Metal Curtain Walls, Electrified M-Floors, Acoustical and Troffer Forms, Acoustical Metal Ceilings, Steel Roof Decks, and Long Span M-Decks.

The Mahon Power Operated Rolling Steel Doors shown here are installed in openings 48'-5" x 15'-6". The Roll-up Curtains are constructed from 6" Jumbo Slats of 16 Ga. Galvanized Steel which is Bonderized and Dip-Coated with Oven-Baked Enamel.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

Above is a New, Enclosed Loading Dock at Mars, Inc., Chicago, Ill., Manufacturers of the famous Mars Candy Bars and numerous other confections. Four Mahon Power Operated Rolling Steel Doors, 48'-5" x 15'-6", are installed in the loading dock openings. Walter J. Olson & Co., General Contractors.

MAHON

Materials and Labor Prices

Market Quotations by ENR Field Reporters

IRON AND STEEL PRODUCTS — PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton | Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.50	$5.30	$5.675	$12.25	.....	$110.00	$130.00	$6.975	$9.75	$6.00	.....
Chicago Area	5.50	5.30	5.675	12.25	$6.50	110.00	130.00	6.975	9.75	6.00	.....
Pittsburgh Area	5.50	5.30	5.675	12.25	6.50	110.00	130.00	6.975	9.75	6.00	$14.75
Buffalo Area	5.50	5.30	5.675	12.25	6.50	110.00	130.00	6.975	9.75	6.00	14.75
Cleveland	.....	.....	5.675	12.25	6.50	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.675	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.50	5.30	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	6.20	.....	6.375	.....	6.50	.....	.....	.....	9.75	6.875	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	89.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS — F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	STRUCTURAL SHAPES Extras, New York:	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	REINFORCING BARS Extras, New York:	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$9.40		8.75	$8.75		$53.00	$57.00	
Baltimore	9.70		9.00T	.....		44.50	49.00	
Birmingham	9.00ty		8.99ty	8.99ty		59.00p K	76.00p K	
Boston	9.12R K		8.75t	8.75t		49.50 K	54.00 K	
Chicago	9.15s		7.16gu	7.16gu		52.00‡U	63.00‡U	
Cincinnati	9.56akt		9.04‡	.....		44.50 Kq	49.00mn Kq	
Cleveland	8.48at		7.14ct	.....		46.50 KL	51.00 KL	
Dallas	10.40M		9.00	9.00		44.00u	48.50u	
Denver	10.16c K		9.25c	.....		63.00n	69.00n	
Detroit	9.56a 9.06M		7.15Q	11.85Q		58.00O	63.00O	
Kansas City	9.82aT		8.10N	.....		49.00	60.00	
Los Angeles	8.90dkt		7.35frt	.....		58.00S	64.00S	
Minneapolis	.....		9.26T	9.26T		44.50 K	49.00 K	
Montreal	7.90–8.80cCF/8.20–8.90AtF		7.00/7.50PGi	7.00/7.50PGi		65.70h	70.20h	
New Orleans	.....		8.00gktz	.....		48.50 K	53.50 K	
New York	9.84‡z		8.80ty	8.80y		52.00n	59.00ne	
Philadelphia	9.20bR		8.23R	.....		44.50‡UR	55.20‡UR	
Pittsburgh	9.00y		7.35y	.....		49.50‡rw	54.00‡rw	
St. Louis	9.48etz		7.75‡trQ	7.75‡trQ		61.00wz K	62.00wz K	
San Francisco	9.90aS		9.55gS	.....		52.00S	56.00S	
Seattle	10.20aD		8.85DM	.....		67.00‡nD	73.50‡nD	
Toronto	9.20H		7.85	7.85		48.10qqJ	55.10qqJ	

Quantity extras, per cwt: under 100#, +$10; 100-399#, +$7; 400-999#, +4.00; 1000-1999#, +1.25; 2000-4999#, base price; 5000-9999#, -25c; 10,000-19,999#, -50c; 20,000-29,999#, -75c; 30,000# and up, -1.25

EXTRAS, per cwt: •Quantity (applies to LCL shipments only): under 1,000#, +$1.90; 1000-1999#, +$1.50; 2000-4999#, +$1.20; 5000-9999#, +90c; 10,000-19,999#, +60c; 20,000-29,999#, +30c; 30,000-39,999#, +10c; 40,000# & up, base. •Size: #3 to #7, +$2.50; #8 to #9, +$1.40; #10 to #11, +50c. •Bending: +$2.20 (except in New York City and surrounding metropolitan area where bending must be done at mills by others); over 500 tons, +45c; 200-499 tons, +50c but not over $4500; 75-199 tons, +65c but not over $2000; 20-74 tons, +75c but not over $975; 5-19 tons, +85c but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60c.

WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill:
4 × 18 in., No. 5 & 10 wires — Joliet, Ill., Donora, Pa., Monessen, Pa. $7.04
4 × 12 in., No. 8 & 12 wires — Joliet, Ill., Donora, Pa., Monessen, Pa. $2.62
6 × 6 in., No. 6 & 6 wires — Joliet, Ill., Donora, Pa., Monessen, Pa. $4.17

•‡ Delivered •" Aver. of Canadian & American •# add 4% sales tax •a 2000–4999# •b 10,000–19,999# fob city •c 20 tons or over •d 10,000–29,999# •e Intermediate struct'l •f Incl. delivery in free zone •g CL •h list price; dominion tax exempt; add provincial and municipal taxes •i add provincial and municipal sales taxes •j intermediate and hard grade •k fob city •l delivered; contractor to do unloading •m copper alloy •n LCL •o asphalt coated •p 500 sq. yd. or more. •q 2.5 lb •r less 2% disc. for cash •s 2,000–4,999# •t less ½% disc. 10 days •u add 7.5c switch •v incl 15c del. •w truck lots. •x add 2% sales tax •y add 15c del. •z add 10c del. •A American made. •C Canadian made. •D less ½% for cash. •E 30,000# or over. •F Federal tax exempt for bldgs. •G add 10c del. •H 8.85 without tariff charges. •I 3 lb $60.00. •J 4 lb $47.50. •K less 2% disc. 10 days •L F.o.b. Youngstown plant •M 5,000–9,999# •N 2,000–19,999# •O 100 sy lots •Q 5 tons to CL •R: revised •S less 2% disc. 10th •T less ½% disc, 10th of mo. •U less 2% disc 10 days

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXα	ASBESTOS CEMENT PIPE Z per lin. ft. 6" Press Cl. 150	ASBESTOS CEMENT PIPE Z per lin. ft. 12" Sew Cl. 1500	CLAY SEWER PIPE Per ft., delivered, car load ASTMC 13-55 8 in.	12 in.	ASTMC 200-55T 24 in.	36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTMC 4-55 6 in.	8 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 12 in.	24 in.
Atlanta	130.5	$1.61/1.69	$2.36/2.48	$0.55	$1.00	$4.50	$12.50	$209.00s	$334.00	$0.92m K	$3.68m K
Baltimore	140.1	1.61/1.69	2.19/2.30	.665	1.20	5.05	12.71	187.80	289.20	1.01	2.75
Birmingham	125.8	1.61/1.69	2.26/2.37	.50r	.95r	4.14rw	11.00rw	296.00rz	433.00rz	1.25rS	2.75rS
Boston	143.1	1.63/1.71	2.19/2.30	.784qrtL	1.512qrtL	6.255qrtM	.....	215.40r	330.60r	1.56S	3.47S
Chicago	140.9	1.61/1.69	2.19/2.30	.93rm	1.78rm	7.52rm	21.16rm	220.00Br	330.00Br	1.30	4.00
Cincinnati	135.5	1.63/1.71	2.19/2.30	.665rt	1.2825rt	4.905rt	12.505r	240.00r	370.00r	.85rAB	3.25rAB
Cleveland	141.7	1.63/1.71	2.19/2.30	.602BCN	1.215BC	4.77tBC	12.505tBC	155.40mBC	240.60mBC	1.35	3.60P
Dallas	137.8	1.63/1.71	2.26/2.37	.550‡B	.961B	4.406‡B	9.75‡bB	.....	.....	1.25BD	2.85BD
Denver	148.2	1.71/1.80	2.36/2.48	.52nr	.96nr	3.93nr	.....	460.00nr	580.00nr	1.05m	3.50m
Detroit	142.1	1.61/1.71	2.19/2.30	.90nk	1.70nk	6.80nk	18.50nk	182.00mk	280.50mk	1.10k	4.05k
Kansas City	138.5	1.61/1.71	2.26/2.37	.61r	1.105r	6.104br	16.50r	303.00r	581.00r	.95r	3.25r
Los Angeles	148.6	1.70/1.79	2.19/2.30	.825bl	1.788lS	7.195lS	16.905LST	410.00lS	590.00lS	1.24rE	3.66/9E
Minneapolis	149.9	1.67/1.75	2.26/2.37	.93oB	1.67oB	7.30oB	.....	.....	.....	2.19DFH	6.31DFH
Montreal				1.13u	2.00u	7.00u	13.50u	288.00	545.00	1.17D	3.11pD
New Orleans	133.3	1.61/1.69	2.26/2.37	.566r	1.12r	5.65r	.....	240.50pr	490.00	.95nl	3.75nl
New York	138.5	1.63/1.71	2.19/2.30	1.02	1.49R	7.58	19.48	.....	.....	1.50‡B	3.60‡B
Philadelphia	137.8	1.61/1.69	2.19/2.30	.72‡	1.40‡	9.02R‡v	24.68R‡s	220.00‡R	330.00‡R	1.50‡A	4.00‡A
Pittsburgh	142.9	1.63/1.71	2.19/2.30	.614	1.18	8.14	22.71	190.00	295.00	1.66DS	3.93DB
St. Louis O	136.9	1.61/1.69	2.26/2.37	.62r	1.15r	4.92r	12.68rS	200.00r	400.00r	1.50s	3.65
San Francisco	148.6	1.70/1.79	2.19/2.30	.861d	1.861d	7.531d	18.001d	360.00‡l	620.00‡l	1.05‡Q	3.30‡Q
Seattle	149.0	1.71/1.80	2.19/2.30	.858k	1.83kb	7.61k	.....	250.00‡ck	.....	1.95kty	4.55kty
Toronto	.....	.....	.....	.80F	1.50F	6.00F	.....	157.00F	280.00F	1.05F	4.62F

•† Extra quality. •§ Extra strength. •‡ delivered. •# add 4% sales tax •a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. For explanation of index see ENR Sept. 29, 1955 page 139. •b Extra strength. •a 4-in., $130. •d SS361-A. •f 21 in. •g culvert pipe; reinf., ASTM C 75-56. •h reinf., ASTM C 75-54. •i reinf., ASTM C 76-55. •j centrispun. •k less 2% disc. for cash. •l fob plant. •m truck del. •n LCL del., fob truck. •p less 5% disc. 10th. •p freight allowed to destination in city. •u 35,000# minimum. •r less 2% disc. 10 days. •s 1 ft lengths. •u CSA A 60. •v standard strength. •w SS; add 20% for d.s. •x fob city. •y Reinforced. •z Upper value in range based on both truck lots and less than truck lots, fob city; lower value truck lots delivered. •A single strength. •B truckload. •C less 2% disc. 15th. •D ASTM 76-57. •E less 1% disc. 10 days. •F less 2% disc. 30 days. •G LCL. •H CL. •I fob origin, freight allowed. •J reinf. B14-15. •K Less 2% disc. 15 days. •L ASTM 13-57. •M ASTM 200-57. •N 2 ft lengths. Trucklots. •O add 2% Sales Tax. •P 18 in. •Q less 1% disc. 10th. •S ASTMC 72, 12" 1.55, 24" 4.00. •T extra strength.

•WROUGHT STEEL PIPE

(Full standard weight)

Discount from list; see footnotes

Mill	3½ to 6 in. Lap Weld• Black %	3½ to 6 in. Lap Weld• Galv. %	2½ & 3 in. Butt Weld• Black %	2½ & 3 in. Butt Weld• Galv. %	3½ to 4 in. a	6 in. a	b Continuous	c Seamless
Lorain, Ohio	+2.00/	+18.75/	+2.50	+2.50	3.25	+13.50a		
Alpaugh, Pa	+2.00/	+11.00a	+2.50	+3.50	2.25ab	+13.50ab		
Sparrows Pt., Md.	3.25a		+1.00		3.25a	+13.50a		
Benwood, W. Va.			13.75	+2.50	3.25	+13.50a		
Youngstown, O			13.75	+2.50	3.25ab	+13.50ab		
Indiana Harbor, Ind.			12.75	+2.50	3.25a	+13.50a		
Sharon, Pa			13.75	+2.50	3.25a	50de		
Wheatland, Pa			13.75	+2.50	3.25a	50de		
Etna, Pa			13.75	+2.50	3.25a	50de		
Fontana, Calif			0.75	+15.500	+9.75ab	+26.50ab		

•Threaded and coupled, a 3½ to 4 in. d 6 in. weld. c to 1.5 and 6 in. e 3½ in.

•WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.("based on approx. $200 per net ton): Butt Weld ⅛ in., 5½¢; ¼ in., 8¢; ⅜ in., 8¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 79½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. continuous weld same as lap weld prices. Add freight, 3% transport tax for destination price. † Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 68.54, galv., + 98.77; 1¼ in. black, + 68.54, galv., + 95.23, 1½ in. black, + 81.79 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 98.77; 4½ in. to 6 in. black + 84.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SORRA, D. TARTAGLIA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports, J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

Conn., Ansonia—SCHOOL—BA 7/21—Town, Town Hall, Hilltop Elementary School, Ford St. $447,000. Plans deposit $50. Daniel Antinozzi, Jr., 2503 Main St., Stratford, archt. Richard J. Nowakoski, 529 Howe Ave., Shelton, engr. CD 5/26.

HEAVY CONSTRUCTION—LB & CA

Ralph Richards Constr. Co., 495 Whiting Ave., Dedham, Mass., CA $791,788, est. $800,000, Proj. 9-19-007-05, reconstr. and extension runway-Lawrence Municipal Airport, North Andover, LAWRENCE, MASS. City of Lawrence, Airport Comn., City Hall, Lawrence, Mass. Bids June 15. CD 6/23, under LB.

BUILDINGS—LB & CA

Consolidated Constructors, Inc., 807 Congress St., Portland, Me., CA $621,609, est. $550,000, HOSPITAL addns., alterations, Winship St., BATH, ME. Bath Memorial Hospital, 23 Winship St., Bath, Me. Bids June 2. CD 6/8, under LB.

▲ **Granger Contg. Co., Inc.,** 306 Main St., Worcester, Mass., CA $1,497,500, Oakmont REGIONAL SENIOR-JUNIOR HIGH SCHOOL, Maple Ave., South Ashburnham, ASHBURNHAM and WESTMINSTER, MASS. Towns Ashburnham-Westminster Regional School Dist., c/o James A. Britton, archt., 315 Federal St., Greenfield, Mass. Bids June 5. CD 6/9, under LB.

▲ **Canter Constr. Co.,** 185 Corey Rd., Brookline, Mass., CA Approx. $1,000,000, WAREHOUSE and OFFICE, Harrison Ave. and Asylum St., New York Streets Redevelopment Area, BOSTON, MASS. Graybar Electric Co., 287 Columbus Ave., Boston, Mass. Bids June 2. CD 5/20.

John A. Volpe Constr. Co., 54 Eastern Ave., Malden, Mass., LB $822,130, est. $850,000, HOSPITAL addn., alterations, LOWELL, MASS. St. Joseph's Hospital, 839 Merrimack St., Lowell, Mass. Bids June 30. CD 6/17.

▲ Canter Constr. Co., 185 Corey Rd., Brookline, Mass., CA Approx. $1,000,000, HOSPITAL, Townsend St., ROXBURY, MASS. Jewish Memorial Hospital, 59 Townsend St., Roxbury, Mass. Bids June 3. CD 6/8, under LB.

▲ **Fabrizio & Martin, Inc.,** 1082 Post Rd., Darien, Conn., LB $1,479,473 (10 bidders), technical INSTITUTE, NORWALK, CONN., State P. Wks. Comr., 165 Capital Ave., Hartford, Conn. Bids July 1. CD 6/9.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ **N. Y., Brooklyn**—SCHOOL—BA 8/5—Bd. Educ., City of New York, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures P.S. 262, Macon St. and Reid Ave. $2,026,000. Plans deposit $25 for general, $10 each for trades. CD 3/31/58.

▲ **Pa., Canonsburg**—INSTITUTION—BA 8/5—General State Auth., 18th and Herr Sts., Harrisburg, 784 bed institution for mentally retarded children, Phase 1, Western Pa. State School and Hospital. $9,000,000. Plans deposit $100. Celli-Flynn, 335 Shaw Ave., McKeesport, archts.-engrs. A. F. Jones, c/o owner, ch. engr. CD 4/16.

▲ **N. Y., Brooklyn**—SCHOOL—BA 8/11—Bd. Educ. City of New York, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for addn. to and modernization of existing P.S. 19, South 3rd and Rodney Sts. $1,542,216. Plans deposit $25 for general, $10 each for trades. CD 6/11/58.

▲ **N. Y., Brooklyn**—SCHOOL—BA 8/18—Bd. Educ. City of New York, Bureau of Constr., 42-15 Crescent St., Long Island City, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical and lighting fixtures P.S. 274, Kosciuisko St. and Bushwick Ave. $2,237,502. Plans deposit $25 for general, $10 each for mechanical trades. CD 5/25.

HEAVY CONSTRUCTION—LB & CA

NEW YORK—State Dpt. P. Wks., State Office Bldg., Albany. Bids opened 6/25.

Bero Constr. Corp., P.O. Box 70 W. River Rd., Waterloo, N. Y., LB $805,797, est. $1,131,000 (9 bidders), Gardenville-Williamsville Pt. 1, SH 1733, 0.61 mi. (Rte. 188), FGRC 59-52, Erie Co.

P. Bistriam & H. L. Bishop, Inc., West Hampton Beach, N. Y., LB $491,615, beach protection (artificial beach nourishment and two stone groins) East Hampton, Town of East Hampton, Contr. BP-59-75, Suffolk Co., NEW YORK. Dpt. P. Wks., State Office Bldg., Albany, N. Y. Bids June 25. CD 6/12.

▲† **Samuel N. Zarpas, Inc.,** Campbell's Run Rd., Box 4457, Pittsburgh, Pa. and **Fullerton Constr. Co.,** 19156 Filer Ave., Detroit, Mich., (joint venture). CA $2,655,000 special facilities, Niagara Falls Air Force Base, ENG-30-075-59-190, NIAGARA FALLS, N. Y., U. S. Eng., 111 E. 16th St., New York 3, N. Y. Bids May 27. CD 6/1, under LB.

▲ **NEW JERSEY**—Comr. State Hy. Dpt., State Hy. Office Bldg., 1035 Parkway Ave., Trenton. Bids opened 7/1.

George M. Brewster & Son, Inc., 275 W. Fort Lee Rd., Bogota, N. J., LB $4,474,567 (11 bidders), constr. 2.7 mi. section of new Rte. 129 Freeway, Ewing and Hopewell Twps., Mercer Co. CD 6/9.

▲ **Associated Contractors, Inc.,** Conneaut Lake, Pa., LB $1,322,990, women's DORMITORY, MEADVILLE, PA. Allegheny College, 513 Main St., Meadville, Pa. CD 10/17.

▲† **Wright Contg. Co.,** P.O. Box 38, Odenton, Md., CA $1,522,093, Proj. 100-A-8, grading, draining D. C. line to Taylor Model Basin, George Washington Memorial Parkway, MARYLAND. Bureau P. Roads, 1440 Columbia Pike, Arlington, Va. Bids June 26. CD 6/30, under LB.

† **Charles W. Williams & Assoc., Inc.,** Blyndon, Md., CA $774,987, Proj. 100A4, grading, draining, two box bridges from Taylor Model Basin 1.25 mi. to MacArthur Blvd., Geo. Washington Memorial Parkway, MARYLAND. Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va. Bids June 18. CD 6/24, under LB.

BUILDINGS—LB & CA

▲ **American Village Homes,** c/o Lane Realty Co., 107-40 Queens Blvd., Forest Hills, N. Y., Owner Builds, $1,400,000 (addnl. section), 100 HOUSES, Deer Park Ave. south of Southern State Parkway, BABYLON, N. Y.

Stackler & Frank, c/o Trylon Realty Co., 98-89 Queens Blvd., Forest Hills, N. Y., Owner Builds, $800,000, 50 HOUSES, Union St. and Pat Dr., BABYLON, N. Y.

L. B. Teman Bros., 2 Chester St., Brooklyn, N. Y., LB $434,844 (11 bidders), electrical work and lighting fixtures for modernization work of existing James Madison HIGH SCHOOL, Bedford Ave. and Quentin Rd., BROOKLYN, N. Y. Supt. School Bldgs., Bureau Constr., 4th Fl., 42-15 Crescent St., Long Island City, N. Y. Bids June 30. CD 6/5.

Continental Homes, c/o Trylon Realty Co., 98-89 Queens Blvd., Forest Hills, N. Y., Owner Builds, $690,000, 30 HOUSES, 71st St., JACKSON HEIGHTS, N. Y.

▲ **Edward Beneson, Chester Soling, Irving Seidman & Louis Abramson,** 110 E. 177th St., New York, N. Y., Separate Contracts, $1,000,000, APARTMENT, 132-6 East 76th St. and 1068-78 Lexington Ave., NEW YORK, N. Y. Boak & Raad, 175 Fifth Ave., New York 10, N. Y., archts. CD 9/23.

Soundview Village Homes, c/o Kern Realty Co., 124-26 Queens Blvd., Kew Gardens, N. Y., Owner Builds, $550,000, 25 HOUSES, Cow Neck Rd. west of Port Washington Blvd., PORT WASHINGTON, N. Y.

Harry G. Wells, c/o Harsen & Johns, archts., 60 Westervelt Ave., Tenafly, N. J., Owner Builds, $400,000, 48-unit APARTMENT, Hickory Ave., BERGENFIELD, N. J.

▲ **Bernard Helderman,** 530 South Wood Ave., Linden, N. J., Owner Builds, $3,000,000, 167 HOUSES, Carteret Ave., CARTERET, N. J.

▲ **Jarvis Constr. Co.,** General Delivery, Iselin, N. J., CA $2,500,000, 112 HOUSES, Charlestown-Norton Rds., HAMPTON, N. J. Wankow Real Estate Co., 426 Vosseler Ave., Bound Brook, N. J. Studer & McEldowney, P.O. Box 147, Clinton, N. J., engrs.

▲ **Diesel Constr. Co.,** 4 West 58 St., New York, N. Y., CA Approx. $5,000,000, 2 story, bsmnt., 250,000 sq. ft. DEPARTMENT STORE, at Paramus Shopping Center, Rte. 4, PARAMUS, N. J. Gimbel Bros., Broadway and 33 St., New York, N. Y. CD 5/19.

† **Grunley, Walsh & Blanche, Inc.,** 327 Carroll Ave. N.W., Wash., D. C., CA $511,700, Item 2, CASTING POWDER FACILITIES, NBy-12925, INDIAN HEAD, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 17. CD 6/23.

▲† **Arthur A. Venneri,** 1906 K St. N.W., Wash., D. C., CA $2,273,000, Army MEDICAL SERVICE GRADUATE SCHOOL, Walter Reed Army Medical Center, WASH., D. C. U. S. Eng., 1 and Douglas Sts. N.W., Wash., D. C. Bids June 23. CD 6/29, under LB.

SOUTH

BUILDINGS—BA

Fla., Chattahoochee—WARD—BA 7/23—Bd. Comrs. State Institutions, Tallahassee, ward, Florida State Institutions. Plans deposit $100. Griffin & Gomon, Municipal Airport Bldg., Daytona Beach, archts. CD 11/12, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **WEST VIRGINIA**—State Road Comn., Charleston, Zone 5, Bids opened 6/30.

W. Va.—Vecellio & Grogan, Inc., P.O. Box 31, Beckley, W. Va., LB $1,417,254, grading, draining and structures 1.12 mi. Interstate Rte. 77, Proj. I-77-3(12) 115, Kanawha Co.;

W. Va.—Asheville Contg. Co., P.O. Box 5119, Biltmore Station, Asheville, N. C., LB $1,221,631, grading, draining 2.97 mi. Interstate Rte. 64, Contr. No. 2, Proj. I-64-1(21), Putnam Co. CD 6/16.

▲ **Diamond Constr. Co.,** P.O. Box 647, Savannah, Ga., LB $1,366,970, cargo terminal and paving, BRUNSWICK, GA. Georgia State Ports Auth., State Docks, Savannah, Ga. Bids June 26. CD 6/2.

Alpha Electric Co., Vendue Range, P.O. Box 474, Charleston, S. C., CA $409,445, installation 194.32 mi. telephone lines extending in all directions from Ringgold to all sections of Catoosa County, RINGGOLD, GA. Ringgold Telephone Co., Ringgold, Ga. Awarded June 19.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, Bids opened 6/26.

Tenn.—Oman Constr. Co., Acklen Park, Nashville, Tenn., LB $3,324,043, paving with bit. materials (plant mix) and c. conc., constr. 8 prestressed concrete box beam bridges, 1,937 mi. Int. Rte. 75. Proj. I-75-1 (710, Hamilton Co., LB $1,128,121, grading, 4 concrete, steel bridges, bit. materials (plant mix) c. conc. 0.448 mi. State Rte. No. 27, Spur. Proj. U 02701 (4), Hamilton Co.;

Tenn.—John L. Burns, 2720 Nolensville Rd., Nashville, Tenn., LB $1,364,482, grading, drainage, 4 bridges, 6.451 mi. Int. Rte. No. 40, Proj. I 40-3 (12) 179, Dickson-Williamson and Cheatham Counties;

Tenn.—Roadbuilders Inc., 718 Murfreesboro Rd., Nashville, Tenn., LB $1,262,826, paving with bit. materials relocated section near Una and widening roadway, drainage structures, widening and resurf. addnl. miles 2 lane pavement to 4 lanes with bit. materials (plant mix) 7.533 mi. State Rte. No. 1, Proj SP-2133-A, Davidson Co.;

Tenn.—S&W Constr. Co., 2630 Midland Ave., Memphis, Tenn., LB $2,940,241, paving with c. conc., 10 bridges, 3.464 mi. Int. Rte 55. Proj. I-55-1(5)0, Shelby Co.;

Tenn.—Clinchfield Concrete Co., Wexler St., Kingsport, Tenn., LB $407,774, widening from 2 lanes to 3 lanes roadway drainage structures, incl. concrete deck girder bridge over Clinchfield R. R. and widening and resurf. with bit. materials (plant mix) 4 sections State Rte No. 36 2.893 mi. Proj. SP-959-C, Sullivan Co.;

Tenn.—J. A. Hadley, P. O. 359, Patton St., Humboldt, Tenn., LB $440,077, widening exist. roadway, drainage structures, 7.517 mi. State Rte No. 5. Proj. SP-2038-A, Gibson Co. CD 6/8.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, Bids opened 6/26.

Tenn.—Ford Constr. Co., 1311 E. Court St., Dyersburg, Tenn., LB $311,596, widening exist. substructure, new

(Continued on page 119)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000, other public works $88,000, industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	Mississippi to Rockies
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over
ENR	Engineering News-Record
CD	Construction Daily

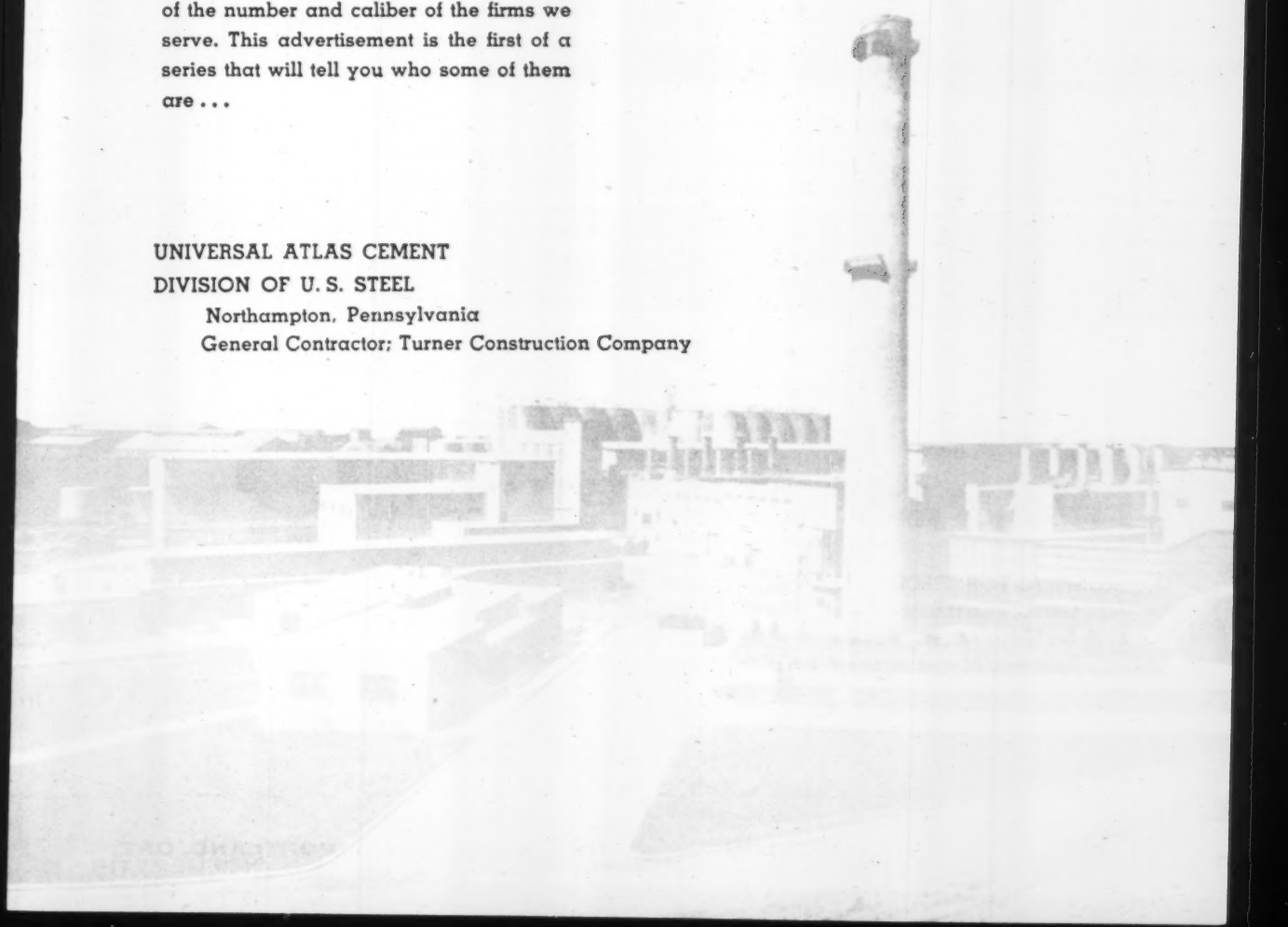
For additional reports see Construction Daily.

A GALLERY OF

VALUED CLIENTS

During more than sixty years as one of America's pioneer electrical contractors, LORD ELECTRIC COMPANY has had the pleasure of serving hundreds of the nation's most estimable businesses. This service has involved electrical installations of every size and description. We are proud of the number and caliber of the firms we serve. This advertisement is the first of a series that will tell you who some of them are . . .

UNIVERSAL ATLAS CEMENT
DIVISION OF U. S. STEEL
Northampton, Pennsylvania
General Contractor; Turner Construction Company



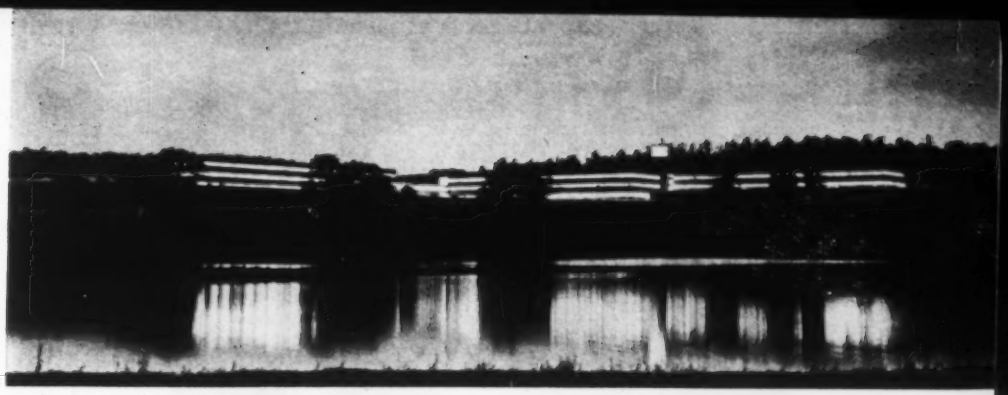
VALUED CLIENTS

These projects, executed for some of America's outstanding firms, are representative of Lord Electric Company's nationwide service in the electrification of American business, industry and public works.

HOSPITAL FOR SPECIAL SURGERY, New York City
General Contractor: Vermilya Brown Company, Inc.
Architect: Rogers & Butler
Engineer: Meyer, Strong & Jones, Inc.

LORD ELECTRIC

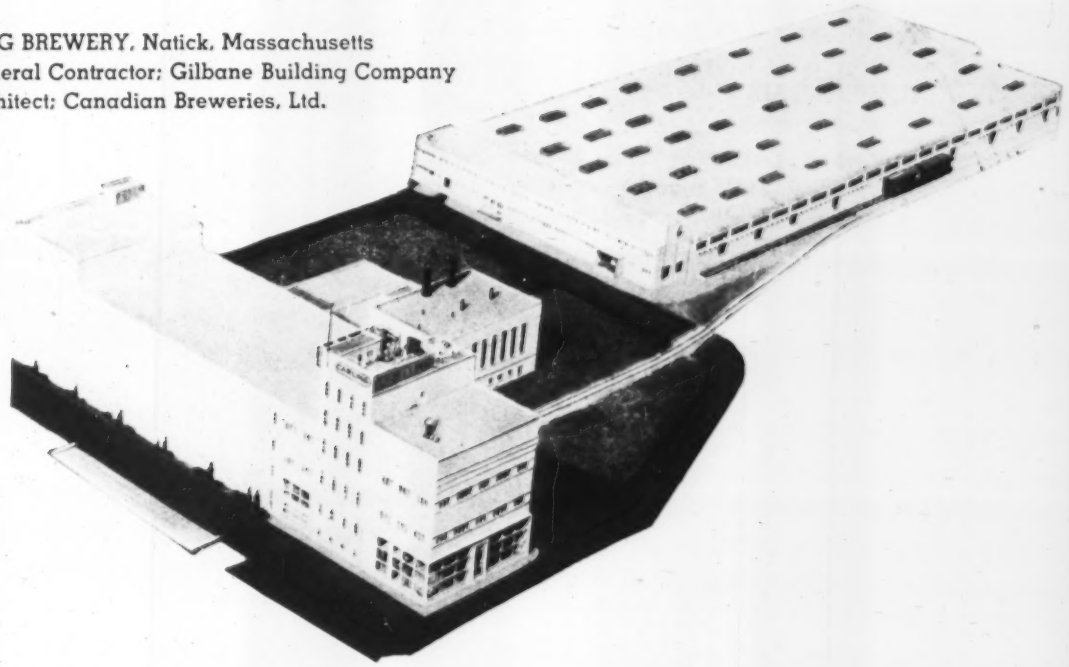
BOSTON NEW YORK PORTLAND, ORE.



IBM FEDERAL SYSTEMS DIVISION
PLANT AND LABORATORY
Owego, New York
General Contractor: Crow-Smith
Architect & Engineers: Giffels & Valet

GATEWAY CENTER, Pittsburgh, Pennsylvania
General Contractors: Starrett Bros. & Eken, Inc.
Architect: Irwin Clavan – Eggers & Higgins
Engineers: Meyer, Strong & Jones

CARLING BREWERY, Natick, Massachusetts
General Contractor: Gilbane Building Company
Architect: Canadian Breweries, Ltd.



COMPANY, INC.

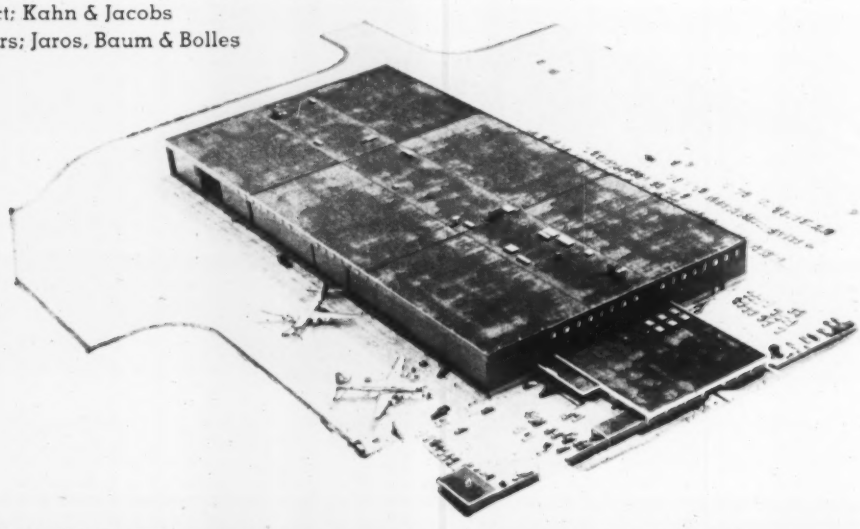
PITTSBURGH RICHLAND, WASH.

VALUED CLIENTS

The gallery of Lord Electric's valued clients is constantly growing. Lord is equipped to perform electrical installations of any scope and description, from wiring a department store to setting up huge atomic facilities. Lord's labor relations in every part of the country are outstanding. And, as it has since 1895, this firm unconditionally guarantees all workmanship and materials supplied by us. Your inquiry will receive our prompt attention. Write to Lord Electric Company, Inc., 10 Rockefeller Plaza, New York 20, N. Y.

DIERKS MEDICAL CENTER, Portland, Oregon
General Contractor: Reimers & Jolivette
Architect: Sundeleaf, Hagestad & Peace
Engineers: Grant Kelley & Associates

AMERICAN AIR LINES — JET MAINTENANCE HANGAR,
New York International Airport
General Contractor: Turner Construction Company
Architect: Kahn & Jacobs
Engineers: Jaros, Baum & Bolles



LORD ELECTRIC COMPANY, INC.

NEW YORK BOSTON PORTLAND, ORE. PITTSBURGH RICHLAND, WASH.

(Continued from page 114)

concrete deck and widening approaches, Hatchie River Bridge State Rte No. 18, approx. 1 mi. north of Bolivar, Hardeman Co.; Part II, widening exist. concrete deck girder overhead bridge and approaches at G.M. & O. R. R. State Rte 18, near Jct. of State Rte 5 south of Bemis, Madison Co., Proj. F-018-1 (2), Pts. I & II, Hardeman and Madison Counties;

Tenn.—**Maxon Constr. Co.**, Inc., 2600 Far Hills, Dayton, O., LB $2,420,587, concrete, steel bridge (65 ft. wide between curbs) and approaches across Clinch River, section Int. Rte No. 40 west of Kingston, Proj. I 40-6 (13) 351, Roane Co. CD 6/8.

▲ **Hyde Constr. Co.**, 1804 North Mill St., Jackson, Miss., CA Est $2,180,000, natural gas sys., Jefferson and Cocke Counties, NEWPORT, TENN. Jefferson-Cocke County Utility Dist., Newport, Tenn.

BUILDINGS—LB & CA

▲ **Little Constr. Co.**, 1327 E. Blvd., Charlotte, N. C., LB $4,140,000, general contract South Wing MEMORIAL HOSPITAL addn., CHARLOTTE, N. C. Charlotte Memorial Hospital, 1400 Scott St., Charlotte, N. C., CD 9/18/57;

L. T. Zoby Plumbing & Heating Co. and Southern Piping & Engineering Co., 4342 Central Ave., Charlotte, N. C., LB $789,000, heating and air-conditioning hospital addn. (Charlotte, N. C.);

Austin Electric Co., P. O. Box 236, Charlotte, N. C., LB $739,789, electrical contract for hospital addn. (Charlotte, N. C.).

J. A. Jones Constr. Co., P. O. Box 966, Charlotte, N. C., CA Est. $500,000, MAIN AND TOLL BLDG. addn., CHARLOTTE, N. C. Southern Bell Telephone Co., Atlanta, Ga.

Daniel Constr. Co., 429 N. Main, Greenville, S. C., CA $750,000, MFG. PLANT, SPARTANBURG, S. C. P. Garvan, Inc., c/o contractor. Bids June 23. CD 6/24.

Beers Constr. Co., 70 Ellis St. N. E., Atlanta, Ga., CA $750,000, CAN MFG. PLANT, ATLANTA, GA. American Can Co., 100 Park Ave., New York, N. Y. CD 2/17.

Mion Constr. Co., Inc., 1846 Chesire Bridge Rd. N. E., Atlanta, Ga., CA $500,000, CHURCH addn. DECATUR, GA. First Baptist Church, Clairmont Ave., Decatur, Ga.

▲ **C. R. Clark Co.**, 8975 NE 6 Ave., Miami, Fla., LB $1,441,597 (7 bidders), SHOPPING CENTER, Palm Springs Village Shopping Center W. 49 St. and W. 41 Place W. 6 and W. 4 Aves. HIALEAH, FLA. R & R Land Co., 5360 Palm Ave., Hialeah, Fla. Bids June 30. CD 6/26.

▲ **Thompson & Street**, 2622 Piedmont Rd. N.E., Atlanta 5, Ga., LB $4,653,000 (3 bidders), STATE PRISON, RAIFORD, FLA. Bd. Comrs. State Institutions, Tallahassee, Fla. Bids June 30. CD 6/5;

Decatur Iron & Steel Works, Decatur, Ala., LB $1,075,171 (2 bidders), jail equipment state prison (Raiford, Fla.).

Renfroe Constr. Co., P. O. Box 71, Fayette, Ala., LB $459,363 (5 bidders), 50 low rent HOUSING UNITS, 28 for whites, 22 for negroes, FAYETTE, ALA., Fayette Housing Auth., City Hall, Fayette, Ala. Evan M. Terry, 2129 Montgomery Highway, Birmingham, Ala., archt.

▲† **Pearch & Gresham Co.**, 2021½ 2 Ave., Box 1527 S. E., Decatur, Ala., CA $2,273,068, MISSILE SYSTEMS TEST FACILITY for solid propellants, Redstone Arsenal, ENG-01-076-59-108, HUNTSVILLE, ALA. U. S. Eng., P. O. Box 1169, Mobile, Ala. Bids June 25. CD 5/21.

† **Ranney Constr. Co.**, Inc., 4395 Poplar Level Rd., Louisville 13, Ky., CA $593,639, brick STOREHOUSES in Wherry Housing Area, IFB A11-15-014-59-146, FORT KNOX, KY. U. S. A. Armor Center, Purchasing Branch, Fort Knox, Ky. Bids May 28. CD 6/3, under LB.

▲ **E. I. duPont de Nemours & Co.**, Fite Rd., Memphis, Tenn., Owner Builds, $2,000,000, CHEMICAL PLANT addn., Memphis Works, Fite Rd., MEMPHIS, TENN.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† **Ill.**, Rantoul—ICBM/IRBM TRAINING FACILITIES—BA 7/30—U. S. Eng., 475 Merchandise Mart, Chicago Zone 54, ICBM/IRBM Training Facilities addns., Site II Chanute Air Force Base, ENG-11-032-60-1, $1,000,000. Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire, Los Angeles, Calif., archts. CD 6/23, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield,

E. T. Simonds, 1020 W. Main, Carbondale, Ill., and **J. D. Barter Co.**, Harrisburg, Ill., CA $1,290,905, 2 grade separation, FAI-51 near Dongola, Union Co. Awarded June 30. CD 6/10, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield, Bids opened 7/2,

Ill.—**Arcole Midwest Corp.**, 3225 Main St., Evanston, Ill., LB $1,455,246 (8 bidders), paving and retaining walls Congress St. Expressway, Oak Park, Cook Co. CD 6/26; LB $1,349,507 (6 bidders), paving 0.42 mi. Northwest Expressway, Chicago, Cook Co. CD 6/18;

Ill.—**Triangle Constr. Co.**, 480 N. Evergreen, Kankakee, Ill., LB $910,500 (6 bidders), wid'n., base course and bridge US 45 near Mermet, Massac Co.; LB $329,392 (4 bidders), bit. surf. 5.64 mi. FAS 1821 near Pinckneyville, Perry Co. CD 6/18;

Ill.—**General Paving Co.**, 30 E. John, Champaign, Ill., LB $876,397 (2 bidders), resurf. US 136 in Rantoul, Champaign Co. CD 6/26;

Ill.—**Charles Ind. Co.**, R.R. 1, Rockford, Ill., LB $837,029, (4 bidders), paving, resurf. US 20 between Rockford and county line, Winnebago Co. CD 6/8;

Ill.—**Payne & Dolan, Inc.**, 8 S. Dearborn, Chicago, Ill., LB $498,402, b. conc. on stone base 5.72 mi. Ill. 159 south of Smithton, St. Clair Co. CD 6/18;

Ill.—**R. B. Potashnick & Regenhardt Constr. Co.**, Box 423, Cape Girardeau, Mo., LB $2,533,000 (6 bidders), paving, frontage roads interchanges grade separation FAI 1-57, Johnson and Williamson Counties. CD 6/26;

Ill.—**Sjostrom Paving Co.**, 1718 7th Ave., Rockford, Ill., LB $859,833, (4 bidders), paving 3.81 mi. US 20 from west of Rockford, Winnebago Co. CD 6/18.

▲† **McAllister-Davis Co.**, 1231 E. Raines Rd., Memphis, Tenn., CA $1,363,100, revetment on Ohio and Mississippi Rivers between Cache River, Illinois Mile 71 (HP) and Island 35 Tennessee, Mile 764 AHP, CIVENG-40-041-59-140, ILLINOIS. U. S. Eng., Box 97, Memphis 1, Tenn. Bids May 21. CD 4/20.

WISCONSIN—State Hy. Comn., State Office Bldg., Madison,

Duncan J. McDougall & Norbert Kalscheur, Inc., Dane, Wis., CA $502,064, grade, subbase and structures 5.843 mi. De Soto-Genoa Rd., S. T. Hy. 35, Contr. 2, Proj. F 057-1(14), Vernon Co. Bids June 16. CD 6/19, under LB.

BUILDINGS—LB & CA

▲ **Par Constr. Co.**, 6505 Ridge Rd., Cleveland 29, O., Owner Builds, $1,500,000, 84 Homes, just south of Dalebrook Development, Donald Dr., BROOK PARK, O.

▲ **Community Redevelopment Corp.**, 714 Chester-Ninth Bldg., Cleveland 14, O. Owner Builds, $1,485,000, APARTMENTS, Garden Valley Rd., CLEVELAND, O. Max Ratner, Chester-Ninth Bldg., Cleveland 14, O., archt.

▲ **Indian Creek Corp.**, 181 Northfield Rd., Bedford, O., Owner Builds, $2,925,000, 150 HOMES, corner of Ledge and Bedford Rds., MACEDONIA, O.

▲ **Joseph J. Duffy Constr. Co.**, 4994 N. Elston St., Chicago, Ill., CA $2,938,579, HIGH SCHOOL, BANNOCKBURN (DEERFIELD, P. O.) ILL. School Dist. No. 113, Bannockburn, Ill. Bids May 21.

Malcolm Housewright, LaHarpe, Ill., CA $437,000, general contract and HIGH SCHOOL, incl. classrooms, library, cafeteria, gymnasium, near Biggsvill, OQUAWKA, ILL. Community Unit School Dist. 115, Henderson Co. Bd. Educ., Oquawka, Ill. Bids May 26. CD 5/8.

▲ **Evans Constr. Co.**, 1900 E. Washington, Springfield, Ill., CA $1,013,220, general contract, CITY HALL, SPRINGFIELD, ILL. City of Springfield, City Hall, Springfield, Ill. Bids Apr. 22. CD 4/28, under LB.

▲† **Sheridan-Murray**, 236 N. Lake Ave., Pasadena, Calif., CA $14,364,000, 900 unit Capehart HOUSING, Richard I. Bong Air Force Base, KANSASVILLE, WIS. Procurement Office, Richard I. Bong Air Force Base, Kansasville, Wis. Lefebvre, Wiggins & Asso., 3868 N. Teutonia Ave., Milwaukee 6, Wis., and Lubin, McGaught & Asso., 220 W. Freemason St., Norfolk, Va., archts. Bids June 10. CD 5/19.

▲ **Selzer-Ornst Co.**, 6222 W. State St., Wauwatosa, Wis., CA Est. $15,000,000, general contract 12 story PARKING-OFFICE-LABORATORY, MILWAUKEE, WIS. Allen-Bradley Co., 136 W. Greenfield Ave., Milwaukee, Wis. CD 12/29.

O. W. Burke Co., 1032 Fisher Bldg., Detroit 2, Mich., CA $867,380, roofing, insulation, flashing and asphalt block contract in certain areas of CONVENTION-EXHIBIT BLDG. (Cobo Hall-Convention Arena Bldg.), Contr. MH 52-J, DETROIT, MICH. City Engineer, 528 City-County Bldg., Detroit 26, Mich. Bids June 2. CD 5/14.

Colfinson Constr. Co., 1271½ McDonald St., Midland, Mich., CA, 1 story, bsmnt. with wing, CHEMICAL RESEARCH LABORATORY, MIDLAND, MICH. Dow Chemical Co., 1000 Main St., Midland, Mich.

▲† **Kaufman & Broad Building Co.**, 15917 West 7 Mile Rd., Detroit 35, Mich., CA $6,159,910, 580 units Capehart HOUSING, SELFRIDGE AIR FORCE BASE, MICH. Base Procurement Office, Selfridge Air Force Base, Mich. Eberle M. Smith & Assoc., Inc., 153 Elizabeth St., Detroit, Mich., archt. Bids May 28. CD 6/30 under LB, Airports.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

† **Neb., Fort Crook**—NOSE CONE FACILITIES—BA On Or About 7/21—U. S. Eng., 1709 Jackson St., Omaha 2, nose cone facilities, Offutt Air Force Base, ENG-25-066-59-141. $400,000-$500,000. CD 1/6/58, under Wyo., Cheyenne.

▲† **Wyoming**—TM SITE 201—BA 7/23—U. S. Eng., 1709 Jackson St., Omaha, Neb., Sundance TM Site 201, operations area, Sundance, ENG-25-066-59-133. $1,600,000-$1,800,000. CD 6/29.

▲† **Minn., Baudette**—ELECTRIC DISTRIBUTION and EMERGENCY POWER PLANT—BA 7/28—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul, Zone 1, electric distribution and emergency power plant, Air Force Station, ENG-21-018-59-36. CD 6/26.

▲ **Tex., Nocona**—BA 8/4—North Montague Co. Water Supply Dist., Farmers Creek Dam, 1 mgd filter plant, treated and raw water supply line, 7 pumps and motors. $1,000,000. Plans deposit $25. Freese, Nichols & Endress, 407 Danciger Bldg., Fort Worth, engrs. CD 5/23/58.

BUILDINGS—BA

Colo., Alamosa—SCIENCE and INDUSTRIAL ARTS BLDG.—BA 7/28—Adams State College, 2 story, science and industrial arts bldg. $900,000. Joseph T. Wilson, Masonic Bldg., archt. CD 2/26.

▲ **Colo., Denver**—HOSPITAL—BA 7/29—St. Anthonys Hospital, West 16 and Quitman Sts., 8 story, bsmnt., 50,000 sq. ft. hospital addn., $1,301,830. Extended date. Monnot & Monnot, 30311½ Classen Blvd., Oklahoma City, Okla., archts. Interstate Engineering Co., 601 26 Ave., Rock Island, Ill., engr. CD 6/17.

HEAVY CONSTRUCTION—LB & CA

▲ **MINNESOTA**—State Hy. Dpt., Capitol Approach, St. Paul, Minn.

Minn.—**Ashbach Constr. Co.**, 1910 W. County Rd. C, St. Paul, Minn., CA $1,442,491, sand grav. sub-base, grav. base, plant mixed bit. surf. and bridge 3.8 mi. between Minnesota-South Dakota State Line and Beaver Creek, Rock Co.;

Minn.—**Industrial Constr. Co.**, 9216 Grand Ave. S., Minneapolis, Minn., CA $596,991, sand-grav. sub-base, grav. base, plant mixed bit. surf. and bridge in Chaska, Carver and Scott Counties. Bids June 19. CD 6/25, under LB.

▲ **MINNESOTA**—State Hy. Dpt., Capitol Approach, St. Paul,

Johnson Bros., 6301 Wayzata Blvd., Minneapolis, Minn., CA $1,194,473 (10 bidders), bit. stabilized base, plant mixed bit. base, surf. 10.1 mi. near Johnsville, Anoka Co. Bids June 26. CD 7/1, under LB.

▲ **IOWA**—State Hy. Comn., Ames, Bids opened 6/30,

Iowa—**Booth & Olson, Inc.**, 529 Ins. Exch. Bldg., Sioux City, Iowa, LB $677,063, c. conc. 1.452 mi., I-IG-29-6(1) 143(I-IG-03-611), Woodbury Co.; LB $1,774,863, c. conc. 5.542 mi., I-IG-29-6-(11) 143, Woodbury Co.; LB $229,721, c. conc. pavement and wid'n. 8.758 mi., F-164(3), Fayette Co.;

Iowa—**E. M. Duesenberg, Inc.**, P. O. Box 1188, Mason City, Iowa, LB $170,649, grading 2.458 mi., I-80-7 (5) 270, Cedar Co.; LB $241,944, grading 2.207 mi., I-80-8(11) 273, Cedar Co.;

Iowa—**Hallett Constr. Co.**, Crosby, Minn., LB $277,673, c. conc. pavement wid'n., and b. conc. resurf 1.235 mi., F-29(10), Wright Co. CD 6/17.

▲ **IOWA**—State Hy. Comn., Ames. Bids opened 6/30,

Iowa—**Hobe Eng. Co.**, 2121 E. 4 St., Sioux City, Iowa, LB $934,929, bridges and culverts, Group 2, I-80-7 (5) 270, Cedar Co.;

Iowa—**Torvick & Sons**, Decorah, Iowa, LB $95,223, bridges, culverts, Group 2, I-80-8(11) 273, Cedar Co.;

Iowa—**A. Olson Constr. Co.**, 1225 Commercial St., Waterloo, Iowa, LB $89,175, bridges, culverts, Group 3, I-80-8(11) 273, Cedar Co. CD 6/17.

† **Wilbur Nielson Co., Inc.**, 1531 N. Saddle Creek Rd., Omaha, Neb., LB $462,416, est. $452,524, (8 bidders), levee and channel alterations Unit III, Section 1, Little Sioux River, Monona Co., CIVENG. 25-066-59-135, IOWA. U. S. Eng., 1709 Jackson, Omaha 2, Neb. Bids June 26. CD 6/3.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, Bids opened 6/25,

Mo.—**Gillioz Co., Inc.**, Monett, Mo., LB $344,765, (6 bidders), graded earth, culverts 3.056 mi.; LB $125,781 (6 bidders), graded earth, culverts 0.601 mi.; LB $96,317 (6 bidders) graded earth, culverts, 0.568 mi.; LB $509,961 (6 bidders), graded earth, culverts, 3.615 mi. all in Newton Co.;

Mo.—**Koss Constr. Co.**, 510 Iowa-Des Moines Bank Bldg., Des Moines, Iowa, LB $1,288,628, (6 bidders), sub-grade, concrete pavements 7.659 mi.; LB $1,245,915 (7 bidders), subgrade, concrete pavements 6.723 mi. both in Cooper Co.; LB $1,028,303 (7 bidders), subgrade, concrete pavement 5.621 mi., Boone Co.;

Mo.—**Reno Constr. Co., Inc.**, P. O. Box 61, Overland Park, Kan., LB $646,768 (3 bidders), graded earth, storm sewers, culverts, wid'n. 2.088 mi., Jasper Co.; LB $249,086 (2 bidders), graded earth, culverts 0.524 mi., Boone Co.;

Mo.—**Freeto Constr. Co., Inc. & Affiliates.**, National Bank Bldg., Box 609, Pittsburg, Kan., LB $792,056 (12 bidders), graded earth, culverts 7.309 mi. Newton Co.;

Mo.—**W. J. Menefee Constr. Co.**, 2500 W. 16th St., P. O. Box 30, Sedalia, Mo., LB $568,494 (3 bidders), grading, culverts, concrete pavements 0.114 mi. St. Francois Co.;

Mo.—**Howard Constr. Co.**, 1504 North Osage, Sedalia, Mo., LB $678,757 (6 bidders), graded earth, culverts, 8.911 mi., Dekalb Co.;

Mo.—**Peter Kiewit Sons Co.**, 1525 S. Glenstone, Springfield, Mo., LB $405,537 (5 bidders), graded earth, culverts, 7.846 mi., Buchanan Co.;

Mo.—**Fruin-Colnon Cont. Co. & Wholly Owned Subsidiaries**, 1708 Olive St., St. Louis 3, Mo., LB $580,000 (3 bidders) b. conc. surf. on floor of 3 spans, removing and replacing remainder concrete deck and all steel handrail, etc., replacing nav. lighting sys. 0.69 mi. St. Charles and Madison Counties. CD 6/8.

▲† **Donovan Constr. Co.**, 1725 Carroll Ave., St. Paul, Minn., CA $2,188,185, 891 units Wherry Housing rehabilitation, repair, Ellsworth Air Force Base, ENG-59-601-59-88, RAPID CITY, S. D. U. S. Eng., Base Procurement Office, Ellsworth Air Force Base, Rapid City, S. D. Bids June 18. CD 7/2, under LB.

▲† **Lawless & Alford, Inc.**, Box 600, Austin, Tex., CA $1,952,773, Nike-Hercules Facilities, incl. 2 identical facilities on 2 different sites, over 10 separate masonry type bldgs., Bergstrom Air Force Base, ENG-41-243-59-80, AUSTIN, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids June 25. CD 6/30.

† **Wm. E. Goetz & Sons**, Box 6448, San Antonio, Tex., LB $699,576 (4 bidders), airmen dormitories imprvs., remodel, LACKLAND AIR FORCE BASE, TEX. Base Procurement Office, Bldg. 5211, Lackland Air Force Base, Tex. Bids June 19. CD 6/26/58, under LB.

† **WYOMING**—Bureau P. Rds., Dpt. Commerce, Denver Federal Center, Denver 25, Colo.,

W. E. Barling, Meeteetse, Wyo., CA $519,880, grading,

(Continued on page 121)

TEAMED UP FOR *Faster* INSTALLATION

NAYLOR Spiralweld pipe and NAYLOR one-piece Wedgelock couplings give you just what it takes to make up dependable lines in a hurry.

The lightweight of the pipe simplifies handling and assembly, while the simplicity of the Wedgelock coupling provides the fastest, most economical method of pipe connection available today.

Whether you need lines for handling water, fresh air or air under pressure, it will pay you to consider the extra performance of this NAYLOR combination.

Write for Bulletin No. 59 for pipe and coupling information.

The NAYLOR Heavy-duty Wedgelock coupling makes a positive connection—can not slip out of standard weight grooved ends. A hammer is the only tool required to connect or disconnect it. Low-pressure type also available.

NAYLOR PIPE *Company*

1248 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

(Continued from page 119)

bit. stabilized base 4.198 mi. Jackson Lake Rd., Grand Teton National Park Proj. 2-A, Jackson Lake, Teton Co. Bids June 25, awarded June 29. CD 7/1, under LB.

† **COLORADO**—Bureau P. Rds., Rm. 242, Bldg. 40, Denver Federal Center, Denver,
H-E Lowdermilk, 1950 West Dartmouth, Englewood, Colo., CA **$499,780**, est. $626,026 (10 bidders), 5.714 mi. Forest Highway Project 16-D, Rio Blanco Co. Bids June 29, awarded. CD 6/22.

BUILDINGS—LB & CA

▲ **Walco, Inc.**, 2710 Nicollet Ave., Minneapolis, Minn., LB **$1,294,426** (9 bidders), general contract, 3 story JUNIOR HIGH SCHOOL, COLUMBIA HEIGHTS, MINN. Bd. Educ., Columbia Heights, Minn. Bids July 1. CD 6/4.

John Epple Constr. Co., 1417 Hickory St., Columbia, Mo., CA **$860,000**. CFA Proj. No. MO-23CH-45D, 2 DORMITORIES (A) 4 story, 59 x 122 ft., (B) 3 story, 60 x 146 ft., COLUMBIA, MO. Stephens College, East Broadway and College St., Columbia, Mo. Bids June 10. CD 7/1, under LB.

▲† **Robert E. McKee**, Federal Reserve Bank Office, Wood and Browder Sts., Dallas, Tex., LB **$5,671,400** (12 bidders), FEDERAL OFFICE BLDG., LITTLE ROCK, ARK. General Services Admin., 1114 Commerce St., Dallas, Tex. Bids June 30. CD 6/26.

▲ **Wilshire Contractors, Inc.**, 8814 Sunset Blvd., Los Angeles, Calif., CA **$4,896,000**, 304 units CAPEHART HOUSING, Grand Forks Air Force Base (No. 2) IFB 32-605-59-24, GRAND FORKS, N. D. Base Procurement Office, Grand Forks Air Force Base, Grand Forks, N. D. CD 7/1, under LB.

▲† **Cedric Sanders Co.**, 115 East St. Andrews Pl., Santa Ana, Calif., CA **$5,182,929**, 320 unit CAPEHART HOUSING, Minot Air Force Base No. 3, MINOT, N. D. Procurement Office, Minot Air Force Base, Minot, N. D. Cushing, Servis, Van Doren & Hazard, 2910 Topeka Blvd., Topeka, Kan., archts. CD 4/27.

Refinery Engineers Co., Wright Bldg., Tulsa, Okla., EA Over **$500,000**, design and construct oil and asphalt REFINERY remodeling, enlarging, WYNNEWOOD, OKLA. Kerr-McGee Co., Kerr-McGee Bldg., Oklahoma City, Okla.

▲ **Centex Constr. Co.**, 4606 Greenville St., Dallas, Tex., CA Est. **$3,000,000**, 14 story OFFICE, BEAUMONT, TEX. Raymond D. Nasher, Republic Bank Bldg., and Centex Constr. Co., 4606 Greenville Ave., Dallas, Tex. CD 1/15.

▲ **Shelton Constr. Co.**, 4511 Travis St., Dallas, Tex., CA **$1,248,000**, ADMINISTRATION NURSES HOME, REHABILITATION UNIT, WAREHOUSE, DENTON, TEX. Bd. for Texas State Hospital & Special Schools, 4405 N. Lamar Blvd., Box "S", Capitol Station, Austin, Tex. Bids June 18. CD 6/24, under LB.

▲ **P. G. Bell & Co., Inc.**, Box 13196, Houston 19, Tex., CA **$1,453,127**, PSYCHIATRIC RESEARCH HOSPITAL on mental illnesses, HOUSTON, TEX. Bd. for Texas State Hospitals & Special Schools, 4405 Lamar Blvd., Austin, Tex. Bids June 17. DC 6/25, under LB.

▲ **Linbeck Constr. Corp.**, Box 13007, Houston, Tex., CA **$1,299,000**, NURSES COLLEGE, HOUSTON, TEX. Texas Medical Center, 1133 M.D. Anderson Blvd. (Texas Women's University, Denton, operators), Houston, Tex. Bids June 11. CD 6/24, under LB.

Arthur J. Puig, Contractor, 2333 Vance Jackson Rd., San Antonio, Tex., Owner Builds, **$432,000**, 18 DWELLINGS, Sunshine Park Estates, SAN ANTONIO, TEX. CD 5/28.

▲ **Bd. State Hospitals**, 1100 W. 49th St., Austin, Tex., rejected bids June 18, WARD BLDG., State Hospital, TERRELL, TEX. LB **$1,351,630**. Will re-advertise. CD 6/23, under LB.

▲† **C. H. Leavell & Co.**, 1900 Wyoming St. El Paso, Tex., CA **$1,447,333**, Schedule 1, 2 story, 244 x 270 ft. GUIDED MISSILE MAINTENANCE SHOP, Pueblo Ordnance Depot, ENG-25-066-59-123, PUEBLO, COLO. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids June 18, awarded June 26. CD 6/24, under LB.

▲ **Perl Mack Constr. Co.**, 405 Vallejo, Denver, Colo., Owner Builds, **$30,000,000**, three thousand HOMES in 4 separate neighborhoods, Northglenn City, near THORNTON, COLO. Harman, O'Donnell & Henninger Assoc., 2727 East 2 Ave., Denver, Colo.

▲† **H. B. Zachry Co. Constr. Div.**, P. O. Box 968, Holloman Air Force Base, N. M., and P. O. Box 10188, San Antonio, Tex., LB Sched. A **$1,983,540**, Sched. B **$1,850,591**, RANGE INSTRUMENTATION FACILITIES, gravel and hot-mix 90 mi. roads, etc. at 37 sites throughout Whitie Sands Missile Range area, Dona Ana, Socorro, Lincoln and Otero Counties, Inv. No. ENG-29-005-59-77, LAS CRUCES, N. M. U. S. Eng., P. O. Box 1538, Albuquerque, N. M. Bids June 24. CD 5/20.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Calif., Lompoc**—BOMARC FACILITY—BA 7/28.—U. S. Eng., 751 S. Figueroa St., Los Angeles, BOMARC IM-99B facility, Vandenberg Air Force Base, ENG-04-353-59-104. $3,000,000. Extended date. CD 7/1.

BUILDINGS—BA

Calif., Lompoc — SCHOOL — BA 7/28 — Lompoc School Dist., "L" and Cypress Sts., six 31,783 sq. ft., frame, stucco elementary school addns., Vandenberg Air Force Base. $600,000. Plans deposit $50. Pierre Claeyssens, 11941 Wilshire Blvd., Los Angeles, archt. CD 6/6/58.

BUILDINGS—SLC

▲ **Calif., Los Angeles**—MASONIC TEMPLE—Scottish Rite Cathedral Assn., 929 S. Hope St., soon lets contract, Scottish Masonic Rite Temple, 4373 Wilshire Blvd. $3,000,000. Wm. D. Coffey Assocs. Inc., & Millard Sheets, 649 South Olive St., Los Angeles, archts.-engrs. CD 7/2.

▲ **Calif., Redwood City**—NOVITIATE, etc.—Sisters of St. Francis of Penance & Christian Charity, 250 Oak Grove Ave., Menlo Park, soon lets contract 4 levels, 60x350 ft. cross shaped bldg., spanish tile roof, 100 ft. bell tower, Mt. Alverno Novitiate and Retreat House, Farm Hills. Gene Verge & R. N. Clatworthy, 4342 Eagle Rock, Los Angeles, archts. CD 6/24.

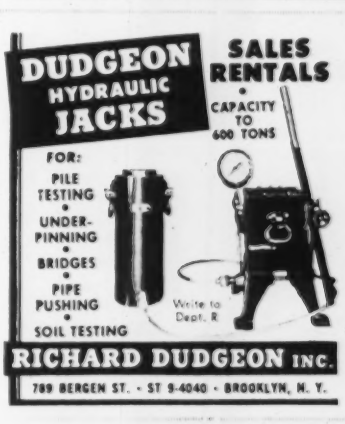
HEAVY CONSTRUCTION—LB & CA

† **Canaday Constr. Co.**, P.O. Box 2007, Seattle, Wash., CA **$649,499**, radar tower, Cottonwood Air Force Station, Inv. 59-99, COTTONWOOD, IDAHO. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids June 23. CD 6/26, under LB.

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City. Bids opened 6/30.

Gardner Constr. Co., S. Simms and W. Quincy Aves., Littleton, Colo., LB **$1,153,403**, 412.16 ft. concrete, steel overpass, 31st St. Ogden, Proj. F 037-1 (4), 2nd contract, Weber Co. CD 6/24.

(Continued on page 126)

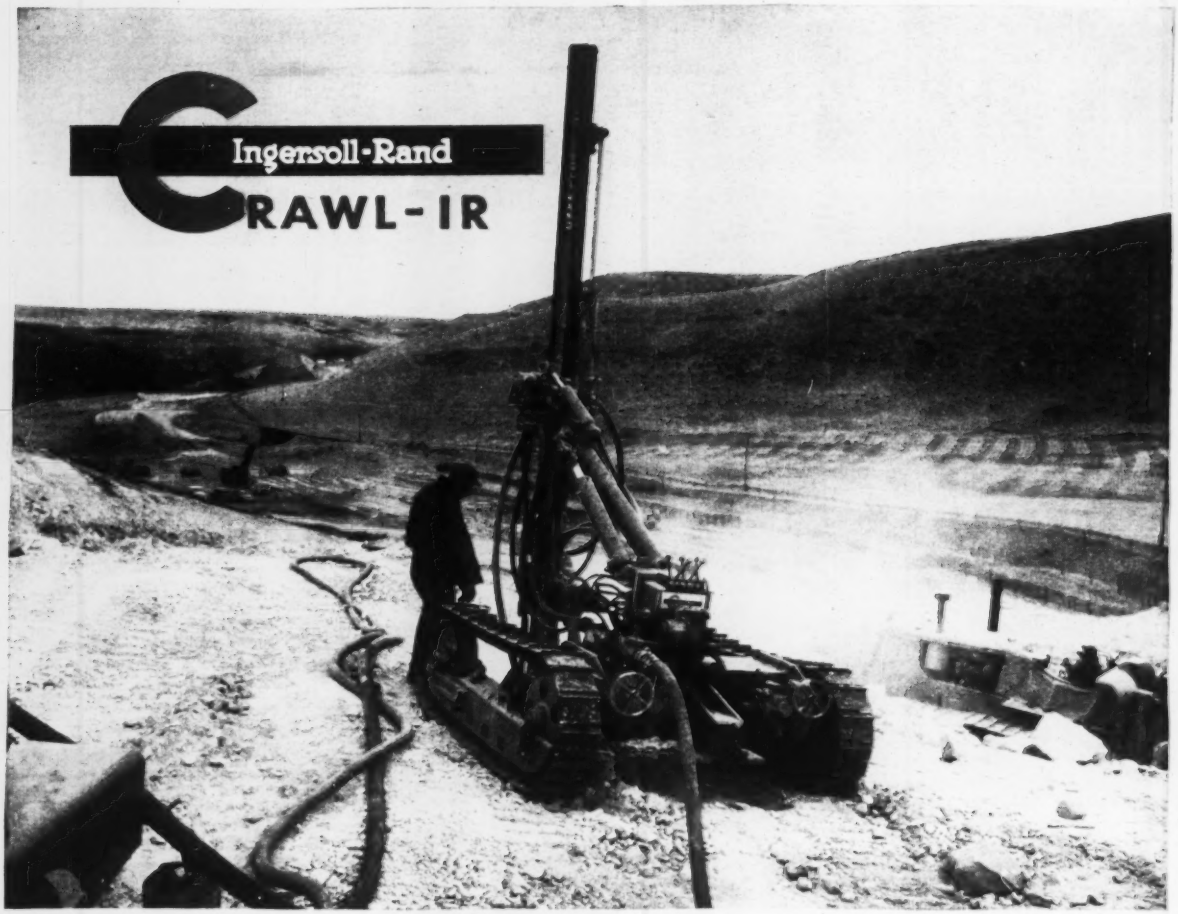


Concrete mix would grind the markings off most tapes!

This is Lufkin's Mezurall® tape . . . with unmatched Chrome Clad® blade that fights concrete, sand, mud and other abrasives.

Lufkin starts with a special tempered steel . . . bonds the markings to it. Then layer after layer of electroplating is applied, topped by a final layer of tough chrome. There's no other blade like it. Comes in 6′, 8′, 10′ and 12′ lengths . . . either ½″ or ¾″ widths. The Lufkin Rule Company, Saginaw, Mich.

THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS



"I've never seen anything like it!"

says Guy Haney, superintendent for
S. Birch & Sons Construction Co.

"It's much superior to anything I ever saw —for speed and continuous operation without breakdowns."

Guy Haney, of S. Birch and Sons Construction Company, Great Falls, Montana, knows hard rock drilling from the ground up —and like most hard rock men he doesn't pass out verbal bouquets lightly. These favorable comments were the result of outstanding performance on the job—and applied to the Ingersoll-Rand CRAWL-IR drill shown above on a highway construction project near Armington, Montana. When photographed, the machine was drilling test holes in sandstone using 3½" Ingersoll-Rand Carset bits.

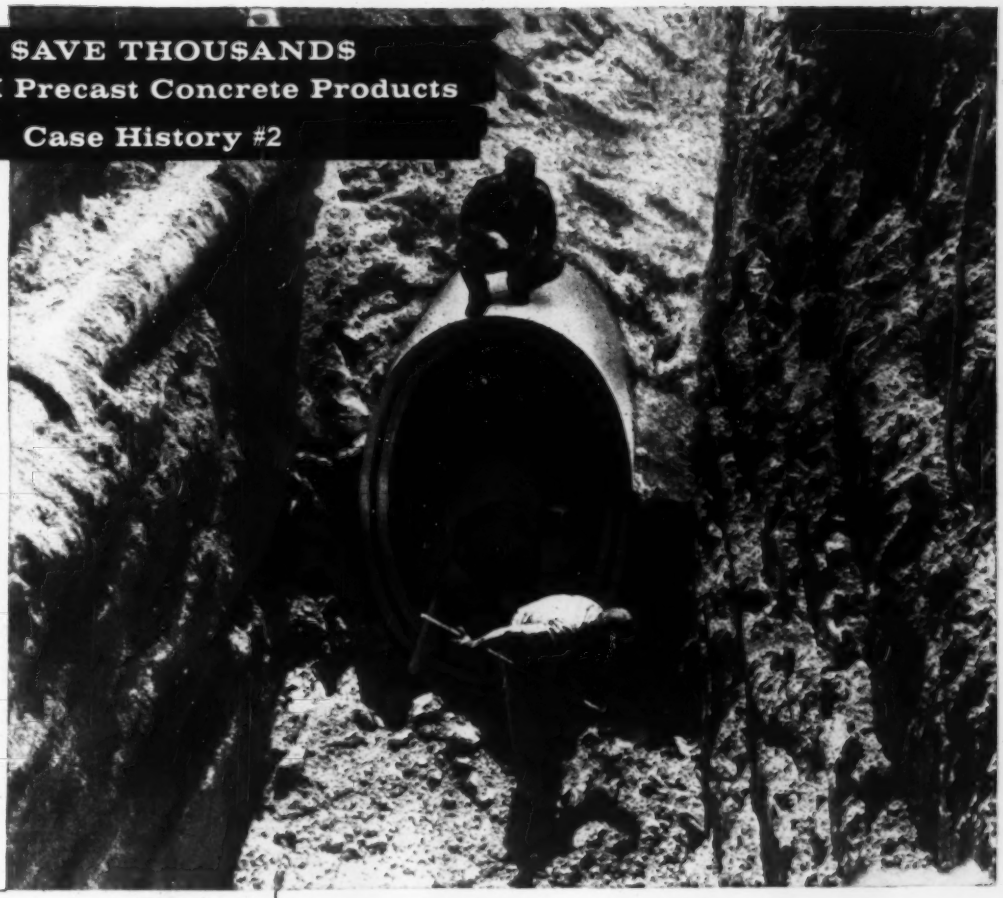
If you want a fully mechanized crawler drill that's really *rugged*—it will pay you to try the Ingersoll-Rand CRAWL-IR. Ask your I-R representative for complete information, or send today for a copy of new Bulletin 4208.

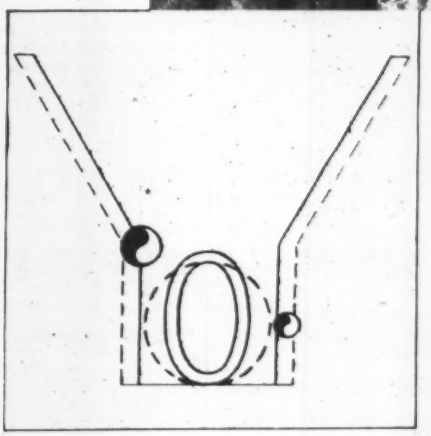
Ingersoll-Rand

5-897 11 Broadway, New York 4, N. Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

INCHES $AVE THOUSAND$
with A-M Precast Concrete Products
Case History #2





Existing water and gas mains limit trench width of Pontiac, Michigan storm sewer. HI-HED provides greater capacity within a workable area.

A-M HI-HED® PIPE CUTS EXCAVATION COSTS DRASTICALLY!

- 18% narrower than equivalent round pipe, HI-HED Pipe cuts valuable inches from trench widths—can save contractors thousands of dollars in excavation costs.
- HI-HED saves customers the expense of removing or relocating utility lines.
- Another bonus benefit—HI-HED pipe design means higher velocities at low flow.

AMERICAN-MARIETTA COMPANY
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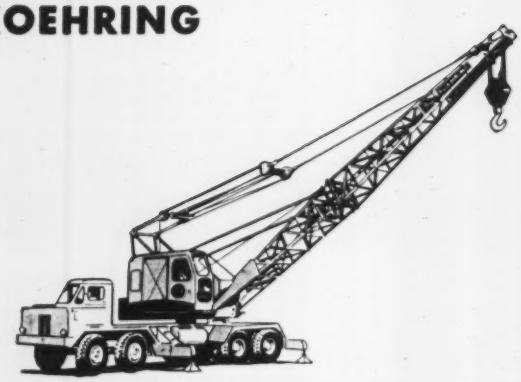
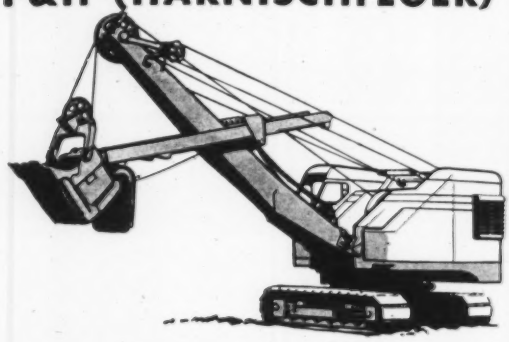
GENERAL OFFICES:
AMERICAN-MARIETTA BUILDING
101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS, PHONE: WHITEHALL 4-5600

KOEHRING



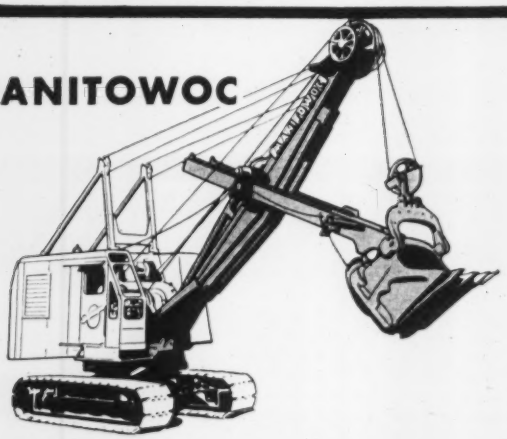
Koehring Model 445 Truck Crane (45 tons) . . . available with a Twin Disc 1500 Series Single-Stage Torque Converter.

P&H (HARNISCHFEGER)



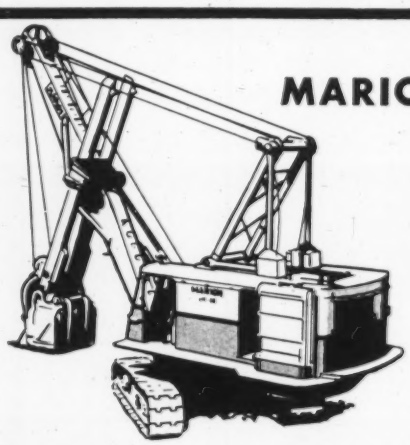
P & H (Harnischfeger) Model 655B with 1½-yard bucket, available with a Twin Disc 11,500 Series Three-Stage Torque Converter. P & H also offers 3½-yard 1055 Series with Twin Disc 13,800 Series Torque Converter.

MANITOWOC



Manitowoc Model 3600 Shovel with 3-yd. bucket . . . offered with a Twin Disc 10,000 Series or 11,500 Series Three-Stage Torque Converter. Six other Manitowoc Models are available with Twin Disc Three-Stage Torque Converters.

MARION



Marion Type 111-M Shovel with 4-yd. bucket, offered with a Twin Disc 11,500 Series Three-Stage Torque Converter. Six other Marion Models, from ¾ through 3 yds., available with Twin Disc 10,000 Series Three-Stage Torque Converters.

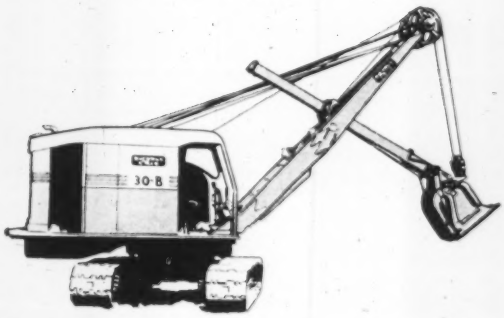
Contractors . . . specify the same that's in your crawler

All of the machines shown here have one thing in common . . . each is offered with an optional Twin Disc Torque Converter, the same make that's in your crawler tractor fleet, whether the machines are yellow, orange or red. Twin Disc Torque Converters have proved their efficiency and dependability in millions of hours of use in Allis-Chalmers, Caterpillar and International crawler tractors!

These leading excavator manufacturers offer Twin Disc Three-Stage or Single-Stage Torque Converters as either standard or optional equipment . . . for seven good, profitable reasons:

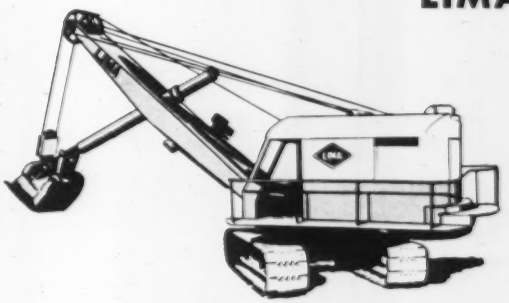
- Twin Disc Torque Converters eliminate lugging and stalling . . . permit engines to operate at maximum speed and efficiency . . . with maximum horsepower always available . . . regardless of load!
- Standardization of Torque Converters reduces maintenance problems . . . slashes spare parts inventories . . . saves time and money.
- Twin Disc Torque Converters cushion out destructive shocks and vibrations normally transmitted by direct-drives . . . for *less parts wear and replacement . . . for greater productivity year in and year out!*
- On a shovel, they deliver up to twice normal torque to the drum—an important advantage in power delivered at slow digging speeds.
- On a crane or clamshell arrangement, they permit safe, accurate control of loads and delicate inching and holding under power.
- They provide an infinite variety of torque ratios . . . automatically and instantaneously . . . according to load demands.

BUCYRUS-ERIE



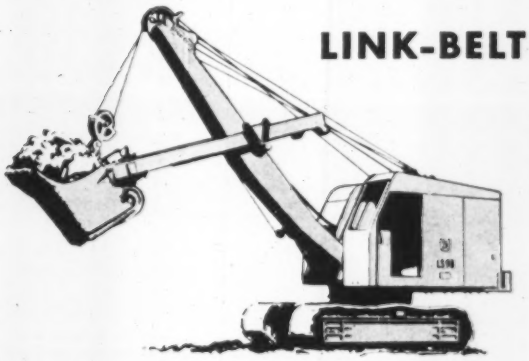
Bucyrus-Erie Model 30-B Shovel with 1-yard bucket . . . available with a Twin Disc 10,000 Series Three-Stage Torque Converter.

LIMA



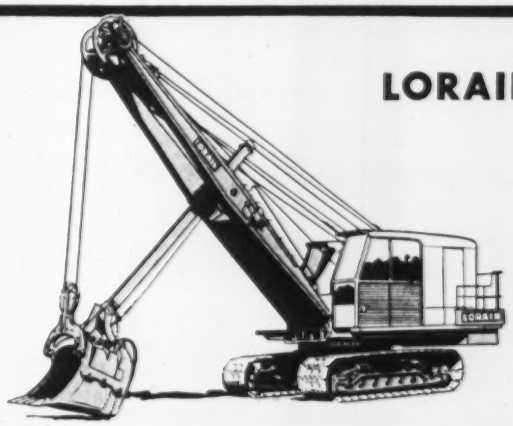
Lima Type 703 Shovel with 1¾-yd. bucket . . . available with a Twin Disc 10,000 Series Three-Stage Torque Converter, which is also offered on Lima Type 803 2½-yd. Shovel. Other Lima products offer Twin Disc Torque Converters and PTO's

LINK-BELT



Link-Belt Speeder Model 98 with 1-yd. bucket . . . available with a Twin Disc 1500 Series Single-Stage Torque Converter.

LORAIN



Lorain-85A Shovel with 2½-yd. bucket . . . offered with a Twin Disc 10,000 Series Three-Stage Torque Converter. Twin Disc also available on Lorain-26 Model ¾-yard Shovel.

converter tractor!

• They extend cable life, cut cable costs . . . by eliminating sharp impact loads . . . by providing constant line tension without dangerous snapping or jerking.

Twin Disc Torque Converters—three-stage or single-stage, from 30 to 1000 hp—are available from all leading excavator manufacturers. Specify one in your next machine. See for yourself why users throughout industry say: A Twin Disc Torque Converter is the wisest investment you can make when buying heavy-duty machinery.

TWIN DISC

Torque Converters

TWIN DISC CLUTCH COMPANY

Racine, Wisconsin

Hydraulic Division, Rockford, Illinois

(Continued from page 121)

Talboe & Harlin Constr. Co., 3091 S. Main St., Salt Lake City, Utah, CA **$789,225**, sewage treatment plant addn., SALT LAKE CITY, UTAH. Salt Lake Suburban Sanitary Dist., 1449 E. 3350 S. Salt Lake City, Utah. Bids May 7. CD 5/20, under LB.

† **Paul Sanetra**, 615 W. Frier Drive, Phoenix, Ariz., CA **$533,987**, 20 family housing units, Winslow Air Force Base, IFB-23-608-59-75, WINSLOW, ARIZ. Procurement Office, Richards-Gebaur Air Force Base, Mo. Bids June 9. CD 6/3.

▲† **M. M. Sundt Constr. Co.**, 440 S. Park Ave., Tucson, Ariz., and **M. J. Bevanda Co.**, 6950 Tujanga St., Box 439, North Hollywood, Calif., CA **$4,119,000**, est. $6,000,000, runway and taxiway, Marine Corp Auxiliary Air Station, Spec. 19477-58, YUMA, ARIZ. P. Wks. Officer, 11th Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids June 23, awarded June 25. CD 6/26, under LB.

† **M. J. Kuney Co.**, N. 120 Ralph St., Spokane, Wash., CA **$690,600**, est. 855,279, radar tower and bldg., Inv. 59-104, MOUNT HEBO AIR FORCE STATION, ORE. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids June 29. CD 6/25.

† **C. R. Schmiedeskamp**, 4726 S.E. Milwaukie Ave., Portland, Ore., LB **$532,967**, est. $699,856 (5 bidders), power bldg. and electrical distr. sys., Inv. 59-103, MOUNT HEBO AIR FORCE STATION, ORE. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids June 29. CD 5/25.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento.

Morrison-Knudsen Co., Inc., Hoge Bldg., Seattle, Wash., CA **$4,912,329**, grading, surf. to constr. 7.5 mi. 4 lane freeway U.S. 101 between Myers Flat and 0.6 mi. south of Dyerville, 2nd unit, Redwood Freeway, incl. 4 bridges, I-Hum-1, C. Humboldt Co. Bids June 17. CD 6/19, under LB.

▲ **Connolly-Pacific Co.**, 1925 Water St., Long Beach, Calif., CA **$1,999,182**, wharf, utilities, Pier E berths 125-127, Sched. A, LONG BEACH, CALIF. Long Beach Harbor Comn., 1333 El Embarcadero St., Long Beach, Calif. Bids June 17. CD 6/22.

† **Dale-Benz, Inc.**, 1357 7th Ave., San Diego, Calif., LB **$539,100**, est. $250,000-$500,000, (8 bidders), Nike-Zeus Test Facilities, Naval Missile Test Center, Spec. 24699, POINT MUGU, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids June 16. CD 6/4.

▲† **Cox Bros. Constr. Co. & J. E. Haddock Ltd.**, Box "C", Stanton, Calif., LB **$1,969,445**, (13 bidders), Runway 3-21 exten., Naval Air Missile Test Center, Spec. 11754-57, POINT MUGU, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids June 18. CD 6/12.

† **Peter Kiewit Sons Co.**, 345 Kieways St., Arcadia, Calif., LB **$798,478**, (4 bidders), waterfront facilities North Harbor, Aux. Landing Field, Spec. 19539-58, SAN CLEMENTE ISLAND, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids June 24. CD 6/10.

Dorfman Constr. Co., 124 N. La Brea Ave., Los Angeles, Calif., CA **$628,680**, 22,025 ft. clay pipe, Miller-Holder Trunk Sewer, Contr. 3-48, Buena Park, SANTA ANA, CALIF. Orange Co. Flood Control Dist., 1104 W. 8th St., Santa Ana, Calif. Bids June 11. CD 6/17, under LB.

BUILDINGS—LB & CA

▲† **Alcon-Pacific Co.**, Box 1551 Anchorage, Alaska, CA **$4,628,416**, 138 family QUARTERS, **Inv. 59-72**, EIELSON AIR FORCE BASE, ALASKA. U. S. Eng., 1519 S. Alaskan Way, Seattle 4, Wash. Bids June 26. CD 7/1, under LB.

▲ **Garff, Ryberg & Garff Constr. Co.**, 85 W. 15th N., Salt Lake City, Utah., LB **$2,927,000**, 5 story 200,000 sq. ft. LIBRARY, PROVO, UTAH. Brigham Young University, Provo, Utah. Bids June 30. CD 6/9.

▲† **C. H. Leavell & Co.**, 1900 Wyoming Ave., El Paso, Tex., CA **$3,978,200**, TECHNICAL BLDG., ENG-04-153-59-95, FORT HUACHUCA, ARIZ. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids June 30. CD 7/2, under LB.

City, 450 Crescent Dr., Beverly Hills, Calif., rejected bids June 12, PARKING GARAGE, Rodeo Dr. and Brighton Way, BEVERLY HILLS, CALIF. LB **$924,420**. CD 6/18, under LB.

South Coast Constr. Co., 230 30th St., Newport Beach, Calif., CA **$425,000**, 40,000 sq. ft. BOWLING ALLEY, 20101 Harbor Blvd., Costa Mesa, Calif. Kona Lanes, Inc., 230 30th St., Newport Beach, Calif. Quigley & Clark, 1102 W. 17th St., Santa Ana, Calif., archts.

Rigano Inc., 417 Guindia Lane, Anaheim, Calif., CA **$505,145**, 11 APARTMENT UNITS, Kensington Lane, Tr. 2252, GARDEN GROVE, CALIF. Maxine Jones, 2180 S. Harbor Blvd., Anaheim, Calif. Bob Jones, 9721 Orange Wood, Anaheim, Calif., archt.

Contracting Engineers, 2310 W. Vernon Ave., Los Angeles, Calif., CA **$900,000**, 180,000 sq. ft. FACTORY addn., HAWTHORNE, CALIF. Mattel, Inc., 5150 Rosecrans Ave., Hawthorne, Calif. Novikoff Engineers, 3858 W. Santa Barbara Ave., Los Angeles, Calif., engrs.

George Feigenbaum, 1710 Courtney Ave., Los Angeles, Calif., Owner Builds, **$400,000**, 4 story APARTMENT, 8430 De Longpre Ave., LOS ANGELES, CALIF. Kenneth S. Iwata, 8277 Beverly Blvd., Los Angeles, Calif., engr.

▲ **Crown Constr. Co.**, 5059 West Pico Blvd., Los Angeles, Calif., LB **$2,246,655** (7 bidders), Las Palmas SCHOOL for Girls, 1500 South McDonnell Ave., LOS ANGELES, CALIF. Bd. Supervs. Los Angeles Co., Hall of Records, Los Angeles, Calif. Bids July 1. CD 6/5.

▲ **Secrest & Fish**, 1909 W. Whittier Blvd., Whittier, Calif., CA **$1,343,744**, 3 story, rein.-con. PHYSICAL SCIENCE addn. and ALT. NO. 9, RIVERSIDE, CALIF. University of California, Riverside Campus, Riverside, Calif. Bids June 2, awarded June 23. CD 6/5, under LB.

▲ **Dinwiddie Constr. Co.**, Crocker Bldg., San Francisco, Calif., CA **$6,381,700**, 8 story, penthouse, 344,550 sq. ft., rein.-con., masonry, precast concrete, quartz aggreg. exterior U. S. COURT HOUSE and FEDERAL OFFICE BLDG. (Lease Purchase), SACRAMENTO, CALIF. General Services Admin., 49-4th St., San Francisco, Calif. Bids June 19. CD 6/23, under LB.

R. E. Hazard, Jr., Inc., 825 W. Laurel St., San Diego, Calif., CA **$400,000**, 67,000 sq. ft. WAREHOUSE, 6701 University Ave., SAN DIEGO, CALIF. M&S Foods, 12th and E Sts., San Diego, Calif.

Country Ranchos, 11687 San Vicente Blvd., Los Angeles, Calif., Owner Builds, **$806,680**, 76 DWELLINGS, Boulder Lake Ave., Lake Ashwood Ave., Lake Artemus Ave., SAN DIEGO, CALIF.

O. G. Long Co., 1546 Pierce St., Santa Clara, Calif., CA **$525,515**, Lyndale SCHOOL, White Rd., SAN JOSE, CALIF. Alum Rock Union Elem. School Dist., 149 N. White Rd., San Jose, Calif. Bids June 10. CD 6/18, under LB.

CANADA

BUILDINGS—BA

Ont., Niagara Falls—COLLEGIATE—BA 7/22—Stamford Dist. Bd. Educ., 1173 Drummond Rd., 2 story, 70,000 sq. ft. concrete, steel, masonry collegiate, $400,000. Plans deposit $50. Gordon S. Adamson & Assocs., 52 St. Clair Ave. E., Toronto, archt. C. D. Carruthers & Wallace Consultants Ltd., 92 Yorkville Ave., Toronto, engrs. CD 10/15.

HEAVY CONSTRUCTION—LB & CA

▲ **Tallman Constr. Co., Ltd.**, 600 Panet Rd., and **Terminal Constr. Co.**, both of Winnipeg, Man., LB **$1,932,559**, airport development, lengthening Runway 01-19 to 11,000 x 200 ft., Runway 11-29 to 10,200 x 200 ft. constr. ancillary taxiways at airport, EDMONTON, ALTA. Dpt. Transport, Hunter Bldgs., Ottawa, Ont. Bids June 26. CD 6/11.

▲ **Robert McAlpine Ltd.**, P. O. Box 249, Weston, Ont., CA **$1,731,736**, Don Valley Parkway, East Branch of Don River to Eglinton Ave., Station 324-00 to Station 414-64, building demolition, grading, paving, drainage, incl. Eglinton Ave. interchange and 2 bridges, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids May 26, awarded June 26. CD 6/18, under LB.

BUILDINGS—LB & CA

▲ **James Kemp Constr. Ltd., 121 Vansitmart St., Hamilton, Ont.**, LB **$1,473,630** (3 bidders), 3 story, EMERGENCY WING EXTENS., Hamilton General Hospital, Barton St., HAMILTON, ONT. City of Hamilton, City Hall, Hamilton, Ont. Bids June 22. CD 6/5.

Principal Investments Ltd., 133 Richmond St. W., Toronto, Ont., Owner Builds, **$544,000**, 2 story, 90 x 240 ft., brick, concrete block, rein.-con., WAREHOUSE and OFFICE, TORONTO, ONT.

▲ **Smith Building Services**, 5330 Royalmount Ave., Montreal, Que., CA Est. **$1,500,000**, 10 story concrete APARTMENT HOUSE, Lakeshore Rd., near Mel Roy Ave., MONTREAL, QUE. Lakeview Towers Ltd., c/o General Contractor, Harold Ship, 5135 Western Ave., Montreal, Que., archt.

U. S. POSSESSIONS

BUILDINGS—BA

† **Guam, Agana**—WAREHOUSE—BA 7/20—U. S. Navy, Office of Director, Pacific Division Bureau Yards & Docks, Bldg. No. 31, Nimitz Highway, Honolulu, Hawaii, supply warehouse for Navy Base, $500,000.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **AUSTRALIA**—BA 9/11—National Capital Development Comm., Australian Capital Territory, P. O. Box 373, Canberra City,

Canberra—891 ft. prestressed concrete bridge, 67 ft. wide over Molonglo River, at Kings Ave. Plans deposit $67.50.

PROPOSED PROJECTS

WATER SUPPLY

N. J., South River—Borough, Borough Hall, generating unit, power plant, and distribution lines, $500,000, Louis P. Klauder, Phila. National Bank Bldg., Phila., Pa., consult. engr.

▲ **Tex., Dallas**—City, City Hall, Proj. 1, 42 and 48 in. water mains, Belt line Coit and Spring Valley Rds. $650,000; Proj. 2, 24, 36 and 48 in. water mains, portion Forest Lane, $309,000; Proj. 3, water mains portion Aurelia Rd. $75,000. C. L. Moon, Inc., 12402 Jupiter Rd., Dallas, Tex., engr. CD 1/31/56.

SEWERS, WASTE DISPOSAL

O., Medina—City, City Hall, bond election Nov. 3, sewer treatment plant expansion and trunk sewers, $650,000. Havens & Emerson, 640 Leader Bldg., Cleveland, Zone 14, consult. engrs. CD 4/9/58.

O., Wilmington—City, City Hall, bond election Nov. 3, sewers. $600,000.

▲ **Pa., Norristown**—East Norriton Twp., Auth., c/o 2828 Swede St., RD 2, sanitary sewers and sewage treatment plant. $2,300,000. Albright & Friel, Inc., 3 Penn Center Plaza, Phila., consult. engr.

BRIDGES

▲ **OHIO**—State Dpt. Hys., State Dpt. Bldg., Columbus.

Ashtabula Co.—Prospect Rd. overpass to re-route Rte. 20 thru city, Ashtabula. $1,800,000. Hargett-Yanda & Barber, 4500 Euclid Ave., Cleveland, O., consult. engrs.

O., Newark—City, City Hall, defeated 3 mill tax levy at June 16 election, replacing Wilson St., Fleek Ave., Manning St. and 11th St. bridges over Licking River. $500,000. CD 3/25.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 24 Wolcott Hill Road, Wethersfield.

New Haven—Mount Carmel Connector, Interstate Rte. 91, Whitney Ave. and Ives St., 4 lanes limited access Hamden and Mount Carmel. $1,000,000.

▲ **Ill., Rockford**—City, City Hall, street paving and overpasses, relocate Northwestern R.R. tracks to Harrison St., extend. Woodruff Ave. overpasses at 15th Ave., Broadway Ave., 20th, 11th, 9th, 7th and Parmelee Sts. $2,000,000. DeLeuw Cather & Co., 150 N. Wacker Dr., Chicago, Zone 6, consult. engrs.

AIRPORTS

▲ **Ont., Crumlin**—HANGARS, etc.—Execaire Ltd., 343 Jasper Ave., Oshawa, hangars, improving facilities, operate industrial service, London municipal airport, Crumlin. $1,000,000.

PUBLIC BUILDINGS

▲ **Ala., Anniston**—HOUSING—Anniston Housing Auth. City Hall plans by Jim Hoffman, 1825 Henry Rd., 100 units housing. $1,272,000.

Ala., Florence—SCHOOL—City Bd. Educ. rebuild Barrell-Slater Junior-Senior High School, $500,000.

Ala., Huntsville—CENTER EXTENSION—University of Alabama, University Campus, Tuscaloosa; plans by W. R. Dickson, Huntsville, University of Alabama extension center for teaching. $750,000.

▲ **Calif., Oakland**—COURTHOUSE, etc.—Alameda County, Courthouse, plans by Mitchell Van Bourg & Assoc., Hotel Claremont, Berkeley; and Ratcliff & Ratcliff, 2286 Fulton St., Berkeley, 6 story, 165,000 sq. ft. courthouse annex, 12th and 13th and Oak and Madison Sts., $4,500,000. Plans by Reynolds & Chamberlain, 3833 Piedmont Ave., Oakland, 5 story, 98,000 sq. ft. welfare bldg., Broadway St. $2,500,000.

▲ **Calif., Santa Cruz**—COURTHOUSE, etc.—Bd. Supervs. Santa Cruz Co., defeated bonds June 23, 96,000 sq. ft. county courthouse, hospital agricultural bldg., law library, $3,250,000. John Lyon Reid & Partners 1019 Market St., San Francisco, archts. CD 5/18.

Calif., Santa Cruz—SCHOOLS—Santa Cruz City Elementary School Dist., 133 Mission St., voted bonds June 2, Bayview School Addn. and Westside Elementary School, $800,000. Falk & Booth, 16 Beale St., San Francisco, archts. CD 4/27.

▲ **Conn., Hartford**—OFFICE—State P. Wks. Dpt., 165 Capitol Ave., office bldg. for State Labor Dpt. $2,700,000.

Conn., Meriden—HOUSING—Meriden Housing Auth., 63 Broadvale Rd., 50 unit rental housing for elderly, Veteran St. $500,000.

▲ **Fla., St. Petersburg**—AUDITORIUM—City, City Hall, municipal auditorium. $1,000,000. Gilberg W. Clifford & Assocs., Treasure Island, consult. engrs.

▲ **Ga., Newnan**—HOSPITAL—Coweta Co. Hospital Auth. plans by Bothwell & Nash 206 Roswell St., Marietta, 154 bed hospital. $1,500,000.

Ga., Savannah—NURSING HOME—Chatham Co. Bd. Comrs., Courthouse, plans by Levy & Kiley, 410 E. Bay, nursing home. $650,000. CD 5/4.

Ga., Toccoa—HOUSING—Toccoa Housing Auth. plans by Stambaugh & Jett, Rhodes Bldg., Atlanta, 62 housing units. $830,000.

Iowa, West Side—SCHOOL—Ar-We-Va Community School Dist., Bd. Educ., voted $745,000 bonds, 2 story, 28,400 sq. ft. high school addn., Smith, Voorhees, Jensen, Silletto Architects Associated, 201 Davidson Bldg., Des Moines, archts.

▲ **Ky., Hazard**—HOUSING—City Housing Auth., City Hall, 102-unit housing. $1,400,000. L. D. Cammack, 650 Maxwelton Court, Lexington, consult. engr.

▲ **Ky., Louisville**—SCHOOL—Louisville Bd. Educ., 506 W. Hill St., plans by D. X. Murphy & Bros., 707 Louisville Trust Bldg., Zone 2, high school alteration, Dundee Rd. $3,000,000. E. R. Ronald & Assoc., 554 S. 3rd St., Zone 2, consult. engrs.

La., Opelousas—HOUSING—St. Landry Parish Housing Auth., Courthouse, plans by L. Jaco LeBlanc & Assocs., Inc., Box 1511, OCS, Lafayette, La., 80 dwelling units in Parish incl. 12 Washington, 18 Krotz Springs, 8 Leonville, 6 Palmeto, 14 Port Barre, 22 Melville. $800,000.

Mass., Ware—SCHOOL—Town, Bldg. Comn., plans by Alderman & MacNeish, 594 Riverdale Rd., West Springfield, high school, Palmer Rd. $700,000. CD 3/19.

(Continued on page 130)

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New 25-ton-capacity PR619. This rear dump introduces the Athey T-line. Totally new to earthmoving. T-line characteristics sound like those of a prizefighter. Incredibly trim. Tough. Fast.

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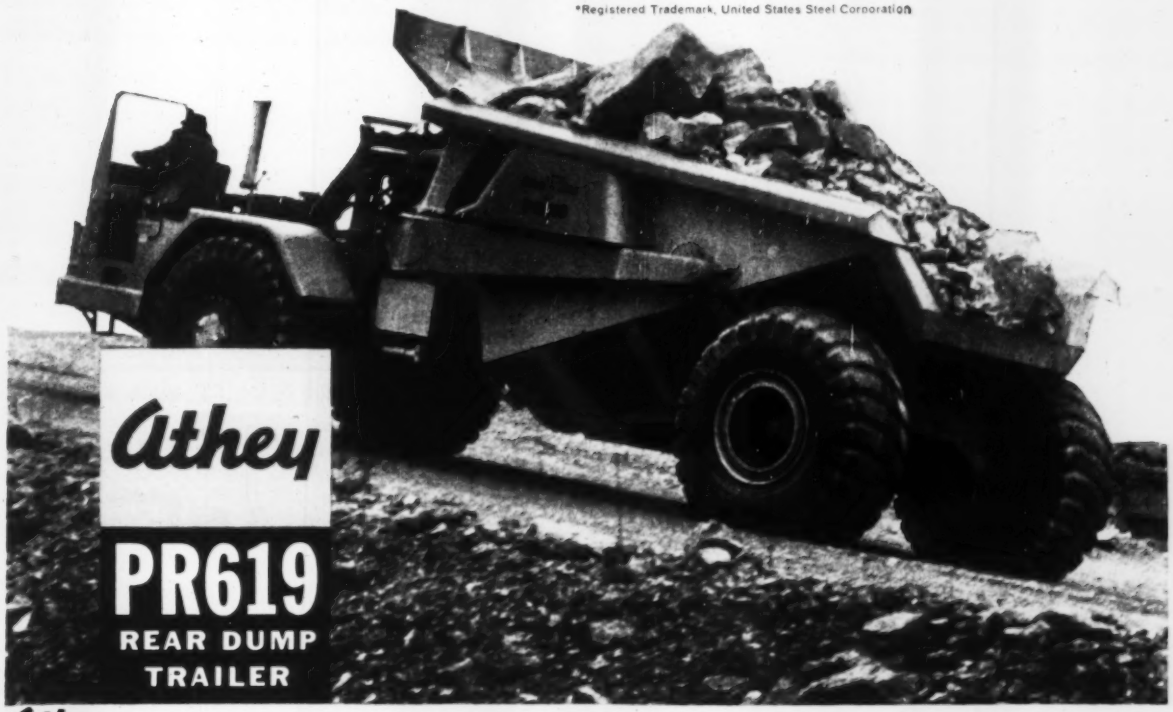

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Which sewage lift station is best for your job?

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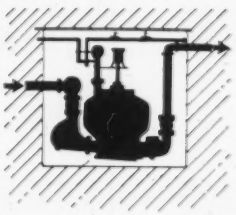

Concrete or steel underground station with Shone® Type S pneumatic ejector, mechanically controlled (warranted 25 years). Remote air supply. Nothing electrical; maintenance free; operates even under water. Life measured in decades. For municipalities and large subdivisions.

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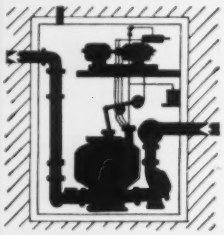
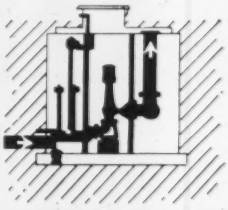


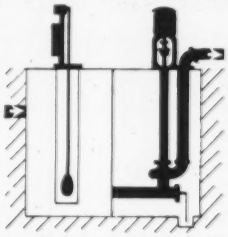
Shone® Type SAC station, underground in concrete vault. Mechanically controlled ejector (warranted 25 years) has its own compressor. Frequently less costly than package stations. Finds use everywhere.

PACKAGE STATION



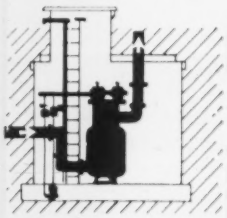
Quality underground station with vertical, short-coupled (Series 6260), dry pit centrifugal pumps. Quality design and equipment give good service life at nominal cost. For small permanent stations, growing areas.

LOW FIRST COST—EASY INSTALLATION



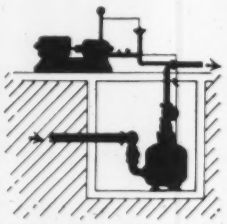
Two-compartment steel basin with centrifugal vertical wet pit pump. Pumps are not submerged; motors protected from flooding. Low first cost; fast installation. For buildings, small growing subdivisions.

ULTIMATE IN PACKAGE DESIGN



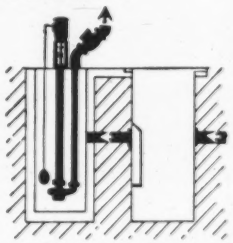
Package underground station with Expelsor® pneumatic ejector, electrode controlled. Sanitary and dependable, low maintenance, easy to service. Recommended for municipal and subdivision applications.

BUILDING TYPE STATION



Expelsor® pneumatic ejector station designed for use in buildings. Compressor is on basement floor; ejector on floor below. Sealed installation gives safe, odorless handling of sewage indoors.

SPECIAL PROBLEMS?



Centrifugal vertical wet pit pumps with adjoining settling basin. Good for areas where sand or old sewers create problems. Special pump construction for abrasive or corrosive conditions, industrial wastes.

The answer depends on the job. Is it to be a temporary station? What about future loads? How much maintenance will it get? What type of power is available? These and many other questions must be weighed carefully and without bias. In making the decision, why not put Yeomans 61 years' experience (59 on underground stations alone) to work? Because Yeomans builds **the only complete line** of sewage lift stations in the industry, recommendations are **impartial** and in your best interest. Phone, wire, or write now.

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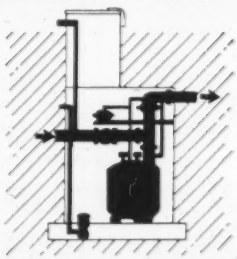

Package underground station. Expelsor® pneumatic ejector has two compartments, duplex compressors and controls. Excellent service accessibility. Especially suited for subdivision and municipal lift stations.

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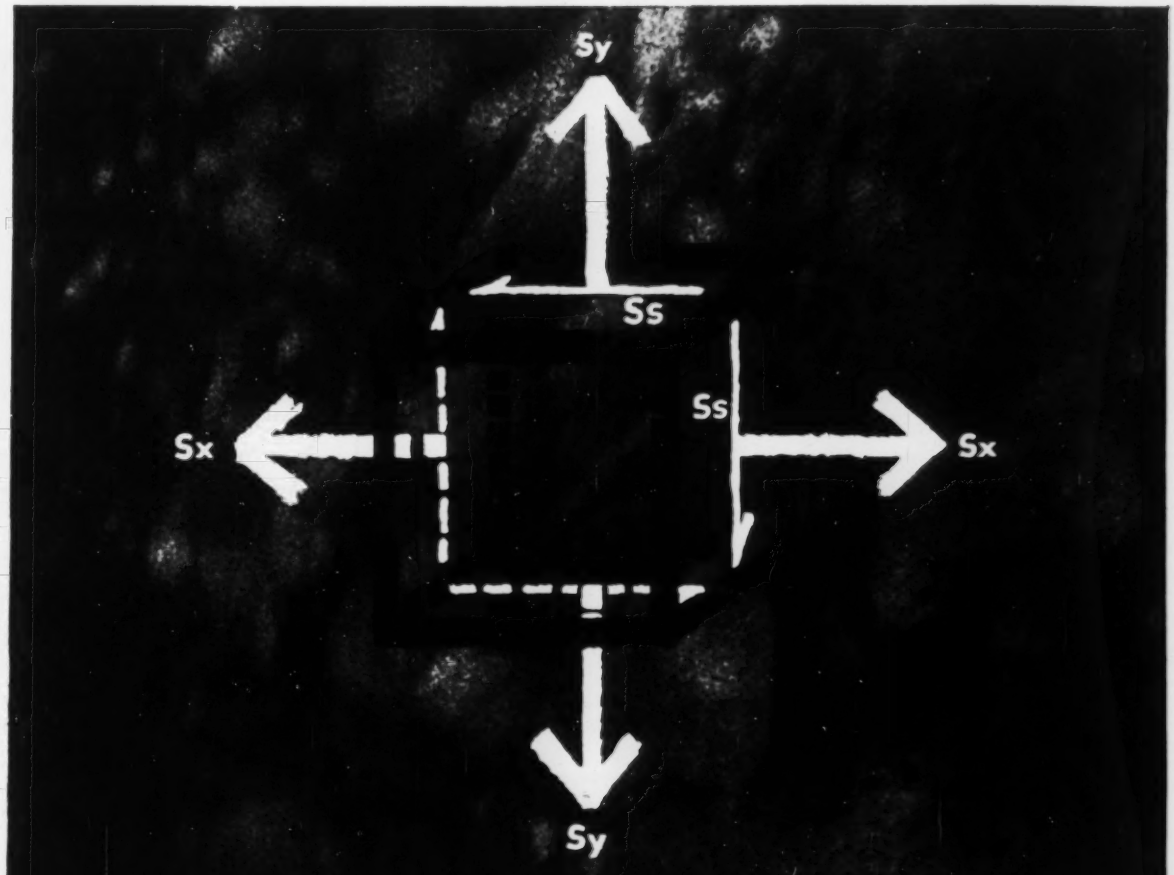

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How Lukens *Application Research* helps you find the right steel plate for the job

If your assignment is designing equipment to withstand abrasive impact, our Application Engineering staff can serve you. Their specialty is helping you track down the precise steel plate for any job. They research a problem from the design stage right through to how the equipment has performed for years after its installation. This practical observation and experience—combined with metallurgical know-how—is yours for the asking. It's been saving our customers money for years.

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Helping Industry Choose Steels That Fit The Job

LUKENS

(Continued from page 126)

▲ **Minn., Fridley**—SCHOOL—Bd. Educ. plans by Patch & Erickson, 2815 Wayzata Blvd., Minneapolis, high school. $2,000,000. Constr. 1960.

Miss., Houston—PLANT—Bd. Supervs. Chickasaw County, Court House, 1 story, 84,000 sq. ft. plant for manufacturing corrugated boxes, etc. Hy. 15 north of city limits. $750,000. Southern Container Corp., lessee.

Miss., Tupelo—HOUSING—City Housing Authority, City Hall, 60-unit low rent housing, S. Canal and Wilson Sts. $750,000-$800,000.

▲ **Mo., Mexico**—HOUSING—City Housing Auth., City Hall, plans by E. E. Butler & Assoc., Haden Bldg., Columbia, Mo., 160-unit public housing. $2,214,745. CD 5/4.

▲ **N. J., Howell Twp. (Adelphia P. O.)**—SCHOOL—Bd. Educ. Twp. of Howell, Farmdale Rd., Adelphia, referendum on bonds and project July 28, elementary school, Havens Bridge Rd., $700,000; elementary school, Freehold Acres, off Rte. 9, $750,000, John MacWilliam, 201 Maple Ave., Metuchen, archt. CD 3/11.

N. J., Manville—SCHOOL—Bd. Educ. Borough of Manville, elementary school, Weston area, $500,000.

▲ **N. J., New Brunswick**—INSTITUTE OF MANAGEMENT AND LABOR—Bd. Trustees Rutgers University, College Place, plans by Edwards & Green, 17 South 5 St., Camden, Institute of Management and Labor. $1,000,000. CD 8/29.

▲ **N. J., Sayreville**—HIGH SCHOOL—Bd. Educ., plans by Edwards & Green, 17 South 5 St., Camden, high school. $3,425,000. CD 12/13/57.

N. Y., Merrick—SCHOOL—Bd. Educ., voted $963,000 bonds May 6, elementary school, Brich St. George J. Dippell, 187 Brooklyn Ave., Massapequa, N. Y., archt. Bids early September. CD 4/13.

N. C., Graham—SCHOOL—Alamance Co. Bd. Educ., Courthouse, plans by McMinn, Norfleet & Wicker, 2828 Lawndale Dr., Greensboro, Southern High School. $775,000.

▲ **O., Ashland**—SCHOOLS—Bd. Educ., bond election Nov. 3, schools. $3,450,000. CD 5/11.

▲ **O., Ashtabula**—SCHOOLS—Edgewood Bd. Educ., bond election Nov. 3, schools. $2,850,000. Fulton, DelaMotte, Larson, Nassau & Assocs., 6014 Euclid Ave., Cleveland 3, O., archts.

▲ **O., Brewster**—SCHOOL—Fairless Bd. Educ., bond election Nov. 3, high school. $1,540,000. CD 11/11/58.

▲ **O., Cleveland**—MUNICIPAL COURT—City, City Hall, Zone 14, bond election Nov. 3, municipal court. $1,750,000. CD 11/10/58.

▲ **O., Mansfield**—SCHOOLS—Bd. Educ. Plans by Bellman, Gillette & Richards, 1600 Madison St., Toledo, Senior High School, 2 junior high schools, 2 elementary schools. $7,000,000. CD 4/30.

O., Mentor Lake—SCHOOLS—Bd. Educ., bond election Nov. 3, two elementary schools. $825,000. CD 11/12/57.

▲ **O., Pemberville**—SCHOOL—Bd. Educ. Eastwood School Dist., bond election Nov. 3, high school, Sugar Ridge and Luckey Rds. $1,200,000. CD 11/12/58.

▲ **O., Sebring**—SCHOOLS—Bd. Educ., bond election Nov. 3, schools. $1,500,000.

Okla., Ponca City—HOSPITAL—City, City Hall, defeated bonds June 23, municipal hospital, $850,000. CD 6/15.

Okla., Wilburton—DORMITORY—Eastern Oklahoma A&M College, women, family and faculty units dormitory, Okla.-CH-23D. $681,000.

▲ **Pa., DuBois**—SCHOOL—DuBois Area Joint School Dist., high school, $2,400,000, secondary school addns. $475,000.

Pa., Tidioute—SCHOOL—Tidoute Area Jct. School Dist., elementary secondary school addn. $500,000.

▲ **S. C., Rock Hill**—SCIENCE BLDG.—Winthrop College, science bldg. $1,000,000.

Tex., San Antonio—SCHOOLS—Harlandale Ind. School Dist., 300 W. Huff St., 2nd high school, $500,000; elementary school addn., $400,000.

▲ **Wash., Vancouver**—PLANT, etc.—Port of Vancouver, foot of W. 16 St., 250 x 500 ft. can mfg. plant and distribution warehouse. $1,000,000. National Can Co., Chicago, Ill., lessee.

▲ **Wis., Eau Claire**—SCHOOL—Bd. Educ. plans by Paul, Hallbeck & Anderson, Inc., 102 E. Grand Ave., Junior-Senior High School. $2,500,000. CD 11/12.

▲ **Wis., Milwaukee**—HOUSING—Housing Auth., 333 W. North Ave., 382 units Carver Housing. $6,483,661.

▲ **Wis., Sheboygan**—HIGH SCHOOL—Bd. Educ., Sheboygan, high school on North Side. $3,300,000.

▲ **Newfoundland, St. John's**—VETERANS' PAVILION—Dpt. P. Wks., Dpt. of Veterans' Affairs, Hunter Bldg., Ottawa, Ont., veterans' pavilion, General Hospital grounds, $1,000,000.

Ont., Wardsville—HOSPITAL—Kent, Elgin, Middlesex and Lambton Counties Newbury, 50-bed county hospital, $625,000.

▲ **Que., Charlesbourg**—INSTITUTION—Minister of Social Welfare & Youth, Parliament Bldgs., Quebec City institution for deaf and dumb children, $2,000,000.

COMMERCIAL BUILDINGS

▲ **Calif., Sacramento**—TEMPLE—Scottish Rite Temple Corp., 2530 J St. plans by Starks, Jozens & Nacht, Native Sons Bldg., Scottish Rite Temple, $2,000,000.

▲ **Conn., Manchester**—HOUSES—Capitol Industries, Old Hebron Rd., 150 houses, "Beechwood Estates" Old Hebron Rd. $1,500,000.

Conn., Hartford—CHURCH—All Saints Russian Orthodox Church, 476 Broad St., 95 x 142 ft. cross shaped limestone and brick church and rectory, Scarborough St., $500,000.

▲ **Conn., Meriden**—HOUSES—Joseph F. Carabetta & Bros., Inc., 47 Hill St., 145 houses, "Birchwood Estates" Foster Lake, $2,465,000.

Conn., Middletown—HOUSES—Morris Haftel, Wadsworth St., plans by Carl E. Segerberg, 363 Main St., 62 houses, Ridgewood Road, Westfield, $620,000.

Conn., North Haven—HOUSES—Kenney Constr. Co., Inc., 31 Broadway, 33 houses "Allendale" Old Hartford Tpk, $689,700.

▲ **Conn., Seymour**—SHOPPING CENTER, etc.—Holliday Lands, c/o Henry T. Moeckel, archt., 35 Hillcrest Ave., Naugatuck, 1 story, 100,000 sq. ft. shopping center, bowling alleys, Seymour-Ansonia town line. $1,000,000.

▲ **Conn., Windsor Locks**—HOUSES—Schnier & Scholmberg, 18 Raymond Rd., West Hartford, 157 houses, "Pleasant View Park", Center St. $2,196,430.

▲ **D. C., Wash.**—THEATER—Loew's Columbia Theater, 1112 F St. N.W., plans by John McNamara, 701 7 Ave., New York, N. Y., theater, $1,000,000.

▲ **Fla., Jacksonville**—HOME FOR AGED—Jacksonville Methodist Homes, Methodist Conference, Lakeland, 500 capacity home for aged, $5,000,000.

▲ **Ga., Atlanta**—SHOPPING CENTER—Clayton Plaza Shopping Center, Inc., c/o Hock & Whitehead, archts., Henry Grady Bldg., shopping center, $1,000,000.

▲ **Ga., Atlanta**—SCHOOL—Marist Society of Georgia, 507 Chandler Bldg., Marist School Ashford-Dunwoody Rd., $1,500,000.

Ga., Savannah—BANK, etc.—First Federal Savings & Loan Assocs., 30 E. Bryan St., plans by Levy & Kiley, 410 E. Bay, bank-office, $850,000. W. H. Armstrong, 26 Peachtree Place N. W., Atlanta, consult engr.

Hawaii, Honolulu—APARTMENT—Kuhio Land Development Co., 2015 Kalakaua, 10 story apartment. $850,000. E. B. Jaffe, 2015 Kalakaua Ave., staff engr.

▲ **Hawaii, Honolulu**—BANK, etc.—Bishop National Bank, 161 S. King, plans by Lemmon, Freeth, Haines & Jones, Kenrock Bldg., 10 story, 250,000 sq. ft. bank, and (2nd—4th floors garage). Over $1,000,000.

▲ **Ill., Granite City**—HOTEL-MOTEL—Chamber of Commerce of the Tri-Cities, et al, 1930 Edison St., 100-room hotel-motel, swimming pool in Tri-Cities area. $1,250,000.

▲ **Iowa, Decorah**—SCIENCE—Luther College, plans by Charles Altfillisch & Assocs., 126½ W. Water St., 2 story, part bsmnt., 45,000 sq. ft., brick, masonry, concrete science bldg., $1,000,000. Bids about Oct. CD 2/6/58.

▲ **Kan., Independence**—HOSPITAL—Mercy Hospital, Sisters of Mercy, plans by McVey, Peddie & Schmidt, 1832 East 2nd St., Wichita, brick, concrete, 110-bed hospital, West Myrtle St. Over $1,300,000. CD 4/27.

▲ **Ky., Louisville**—SHOPPING CENTER—Community Research & Development Inc., 14 W. Saratoga St., Baltimore, Md., plans by Rogers, Taliaferro & Lamb, 411 N. Charles St., Baltimore, Md., 300,000 sq. ft. shopping center, Watterson Expressway and Shelbyville Rd. $3,000,000. James K. Wolford, 2210 Maryland Ave., Baltimore, Md., mechanical engr.

▲ **Mass., Medford**—STORE—Magee's Inc., 30 Revere Beach Parkway, 100,000 sq. ft. store, Wellington Circle. $1,000,000. Constr. 1959. CD 8/30/57, under Owner, c/o Harold A. Rudnick.

Mass., Springfield—HOSPITAL—Wesson Memorial Hospital, 140 High St., plans by Leland, Larsen, Bradley & Hibbard, 711 Boylston St., Boston, Mass., hospital addn. $500,000. Constr. 1959.

▲ **Minn., Northfield**—SCIENCE—Carleton College plans by Yamasaki & Assocs., 1025 East Maple St., (Birmingham), Detroit, Mich., science. $1,400,000. CD 11/20.

Minn., St. Paul—APARTMENTS—Irving Shaw, East-First National Bank Bldg., plans by Hammel & Green, Inc., 1932½ University Ave., ten 2½ story apartments, St. Paul Ave. between Edgecombe Rd. and Davern St. $750,000.

N. J., Levittown—HOSPITAL—Dr. Joseph Foreman & Assoc., 6600 Revere St., Phila., Pa., plans by Morton Strum & Assocs., 250 West Chester Pike, Havertown, Pa., hospital. $600,000.

▲ **N. Y., New York**—RESEARCH and LIBRARY—Cornell University Medical College, 1300 York Ave., Zone 21, plans by Rogers & Butler, 219 E. 44th St., Zone 17, research and library at Cornell University Medical College. $3,200,000.

▲ **O., Berea**—HOMES—Bob Schmitt Homes, P. O. Box 167, plans by Heine Criser & Williamson, 105 Front St., 70 homes, Maple St., Barberry Dr. and 4th Ave., Woodlawn Estates. $1,750,000.

▲ **O., Cleveland**—MEDICAL RESEARCH, etc.—Western Reserve University, 2040 Adelbert Rd., Zone 6, medical school addn. $4,500,000, plans by Garfield Harris, Schafer, Flynn & Williams, 1740 E. 12th St., Zone 14, medical research bldg. for Medical School, $3,500,000. Leon Gordon Miller, Carnegie Hall, Zone 15, space architectural planning for both projects. CD 6/19/57.

▲ **O., Silver Lake**—OFFICE, etc.—The Village Green, c/o Phil J. Franz, 2388 W. Market St., Akron, office and service center, Rte. 5 just east of Village Hall. $1,500,000.

▲ **Pa., Allison Park**—HOUSES—C. E. Kilbert, 440 Greengrove Dr., 96 Brick, bsmnt., houses, Hampton Terrace. $1,000,000.

▲ **Pa., Pottstown**—SHOPPING CENTER—Allen Shops, Inc., 1128 Thomas Rd., Wayne, plans by Sanders & Thomas Assocs., archts. consult. engrs., Pottstown, shopping center, north Charlotte St. $2,000,000. CD 3/26.

S. C., Darlington—HOUSING—Spears & Culberson, housing units. $500,000.

Tenn., Sewanee—LIBRARY—University of the South, Sewanee, library. $750,000. CD 2/26/47.

Tex., Dallas—DWELLINGS—Polk Terrace Inc.(Saul R. Franck) 1315 Cadiz St., plans by C. S. Milam & Assocs., 368 Casa Linda Plaza, 48 brick veneer dwellings, Polk Terrace Subdivision. $525,000.

▲ **Tex., Houston**—STORE, etc.—Battelstein's, Inc., 812 Main St., store, $4,000,000. CD 9/25/56; hard-paved area and auto center, $100,000; earth site development grading, filling leveling drainage, $70,000.

Tex., Houston—AUDITORIUM—Park Place Baptist Church, 4101 Broadway Ave., plans by Ben F. Gennewood & E. Gene Hines Assocs., 2265 W. Holcombe Blvd., 2-3 story steel frame auditorium. $700,000.

Wis., Milwaukee—APARTMENT—Zonita Manor, Inc., 2956 N. Haskett Ave., plans by Willis & Lillian Leenhouts, 3332 N. Donsman St., apartment. $700,000.

▲ **Wis., Oshkosh**—YMCA—Young Men's Christian Assn., 233 Church Ave., YMCA bldg. $1,000,000.

Wis., Waukesha—CHAPEL—Wisconsin Synod of the Presbyterian Church, 255 W. Broadway, chapel at Carroll College, $800,000.

Wis., Waukesha—HOME FOR AGED—Wisconsin Synod of the Presbyterian Church, 255 W. Broadway, Home for Aged, $500,000, Constr. about 1961.

N. S., Sydney—HOSPITAL—Victoria General Hospital, 350-bed hospital addn., $500,000.

▲ **Ont., Toronto**—OFFICE—Coupland Acceptance Ltd., 633 Yonge St., plans by Crang & Boake, 79 Huntley St., 7 story, reinf. concrete frame office, Bay St. and Yorkville Ave., $1,000,000. C. D. Carruthers & Wallace, Consultants Ltd., 92 Yorkville Ave., consult. engrs.

▲ **Ont., Toronto**—HOSPITAL—Provisional Don Mills Hospital Committee, Don Mills Community Council, hospital, $2,250,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Summerland**—RESEARCH and ENGINEERING—General Electric Co. (Technical Military Planning Corp.), 735 State St., Los Angeles, preliminary plans and cost estimates, by Welton Becket & Assocs., 5667 Wilshire Blvd., Los Angeles, Zone 36, research and engineering bldgs.

Conn., Stratford—PLANT—Peerless Aluminum Foundry Co., Inc., 55 Andover St., Bridgeport, die casting industrial plant, Benton St. $500,000.

Conn., Wallingford—PLANT—American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y., plant for production of melamine, $750,000.

▲ **Del., Newark**—WAREHOUSE—Avon Products Co., 240 Schapl warehouse and packing center. $1,000,000.

▲ **Ill., Wilmington**—PLANT—Johnson & Johnson, 500 George St., New Brunswick, N. J., surgical dressings and medical supplies mfg. plant, near here. $2,500,000.

Mass., Fall River—PLANT—Greater Fall River Development Corp., 123 North Main St., plans by Edward M. Corbett, 49 Purchase St., plant. $500,000. Minneapolis-Honeywell Regulator Co., 21 Penn St., lessee. Constr. 1959. CD 12/27/55.

N. C. Fayetteville—PLANT—Cape Fear Development Co., c/o Arthur C. Jenkins, archt., 1304 E. Wendover Ave., Greensboro, 1 and 2 story, 137,000 sq. ft. concrete, steel mfg. plant, $800,000. Cofer, Rouse & Jelinski, 1304 East Wendover Ave., Greensboro, consult. engrs. CD 2/19.

▲ **N. D., Williston**—PLANT—City, City Hall, evaporation slat plant and liquid petroleum gas storage. $1,500,000. Dakota Salt & Chemical Co. sub. of Great Carbon & Chemical Co., Lake Forest, Ill., lessee.

▲ **Pa., Midland**—MILL, etc.—Crucible Steel Co., mill, $20,000,000; ovens, $10,000,000; sheet and strip mill, $7,576,000; electric blooming mill and soak pits, $12,660,000; high lift blooming slab mill, $20,000,000. B. L. Jones, c/o owner, ch. engr.

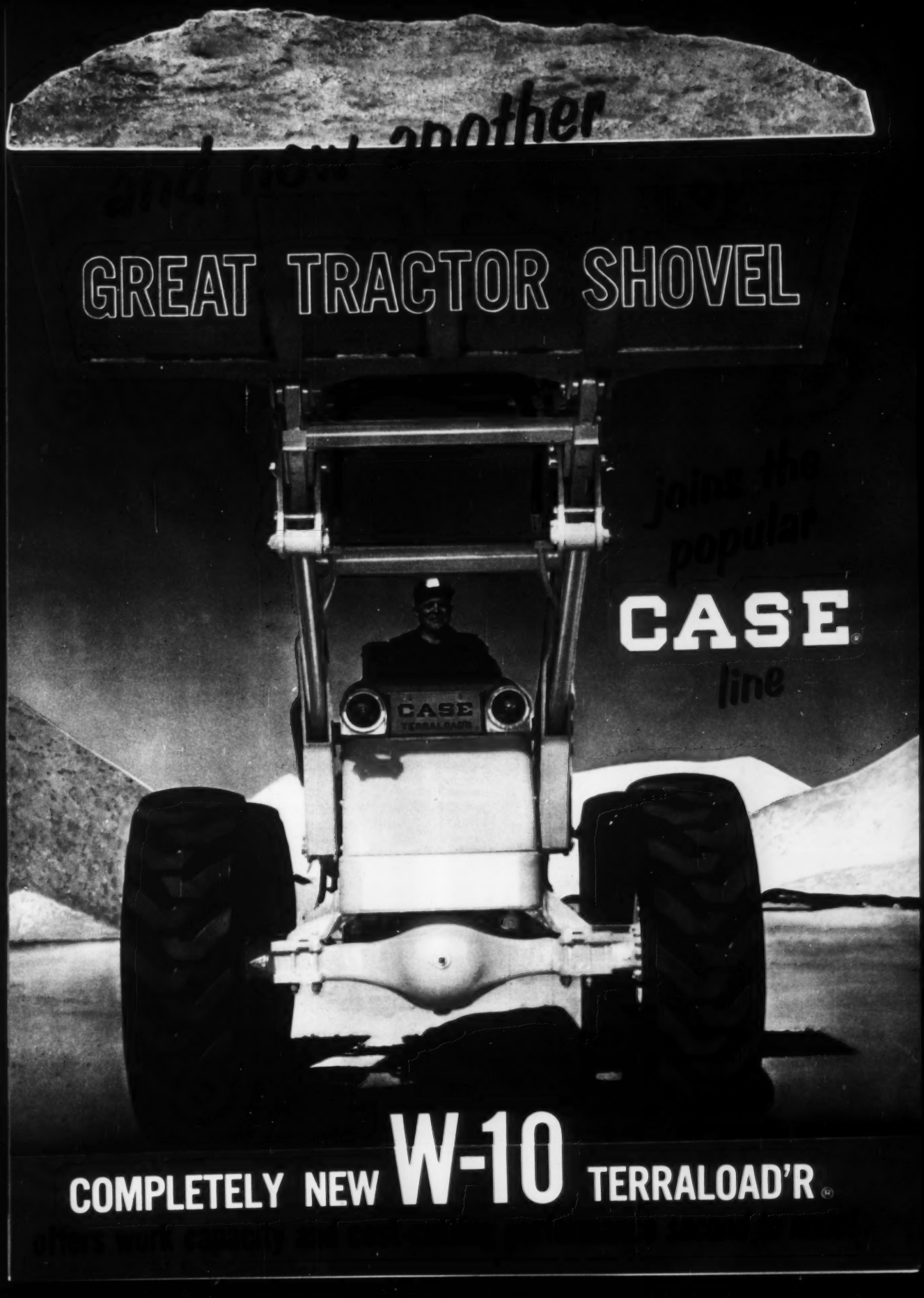
▲ **Tex., Orange**—PLANT—NGL Corp., Earle F. Gray, Jr., pres., 5619 Fannin St., Houston, Tex., petroleum processing plant, 55-acre site, 3 mi. south of here, $8,500,000; rein.-concrete fdns. for plant, $250,000; lighting sys. for plant, $96,000.

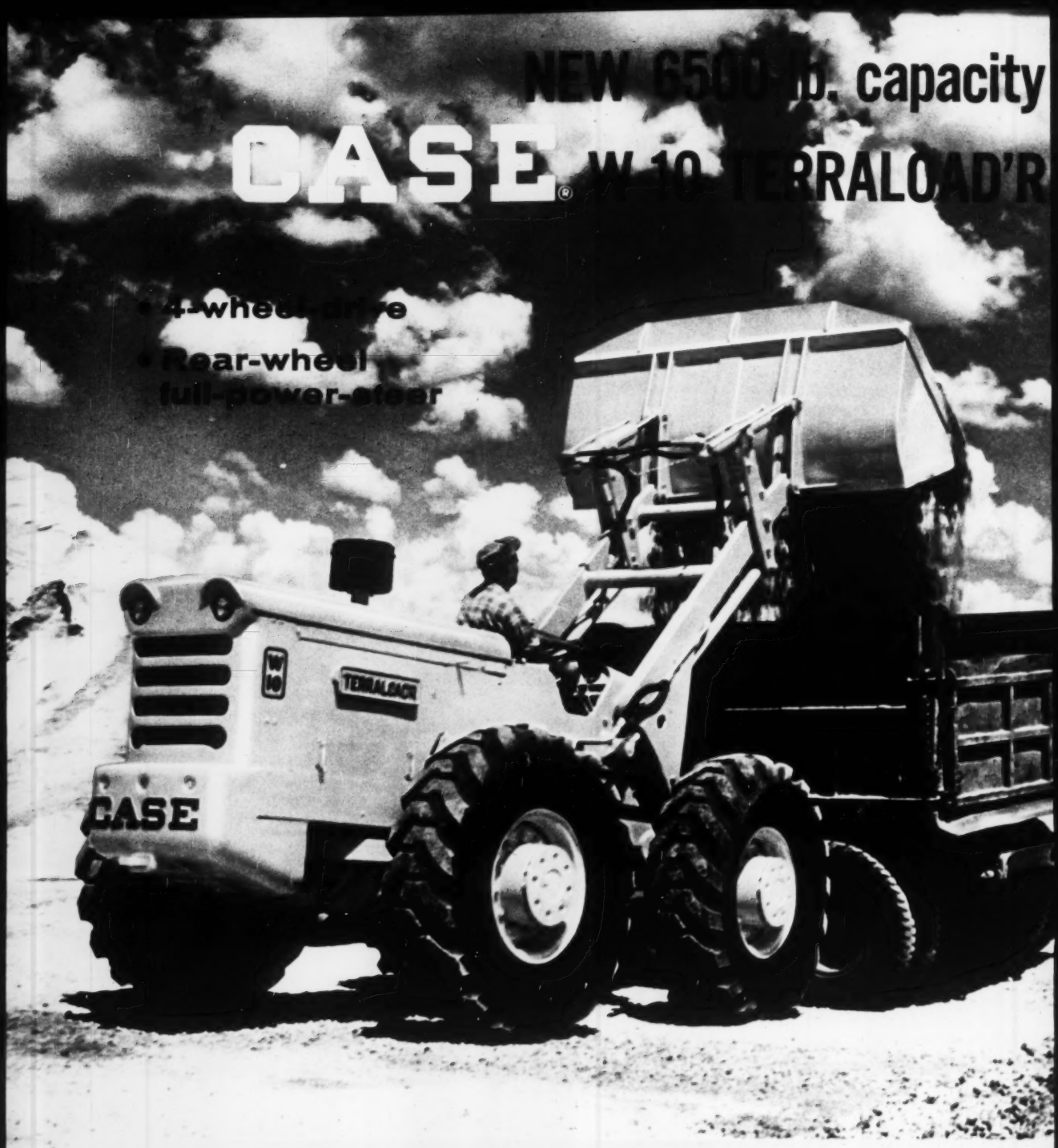
▲ **Wash., Seattle**—LABORATORIES—Boeing Airplane Co., 7755 E. Marginal Way, Zone 4, 3 story, 93 x 453 ft. scientific laboratories, $2,250,000. Work to start this year.

UNCLASSIFIED

Mississippi—RURAL DISTRIBUTION LINES—Southwest Mississippi Electric Power Assn., Lorman, 137 mi. distr. lines, 29 mi. tie lines, 16 mi. line conversion 5000 kva substation at Brookhaven, Miss. Over $500,000. CD 4/6/55.

▲ **O., Toledo** — BULKHEAD — Toledo-Lucas Co. Port Auth., 241 Superior, extending bulkhead at Presque Isle Terminal from 800 to 1,500 ft., filling in area partly submerged, etc., $2,900,000; liquid cargo trestle, $200,000; paving railroad tracks, lighting, parking areas and cargo transit shed, $1,400,000. Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, N. Y., consult. engrs. CD 10/11/54.


another
GREAT TRACTOR SHOVEL
joins the popular
CASE
line
CASE
TERRALOAD'R
COMPLETELY NEW W-10 TERRALOAD'R



WORLD-FAMOUS CASE DIESEL gives you better performance, greater economy

The W-10 was engineered to take *full advantage* of the tremendous power developed by the famous Case 401-cu. in. diesel engine . . . field-proven by over 12,000,000 hours of operation on jobs the world-over.

★ **POWRCEL combustion** — gives greater fuel economy, cleaner burning, smoother running . . . plus direct 24-volt electric starting.

★ **Six-point fuel filtration** — plus dry-type air filter which reduces dirt intake more than 90% over oil-bath cleaners.

★ **Extra-heavy, ribbed engine block** — gives more rigid engine, reduces flexing and results in less internal wear . . . increases usable HP and lengthens engine life.

★ **Heavy-duty 7 bearing crankshaft** — with 116 sq. in. of bearing surface . . . more than any other engine in its HP class.

★ **Pressurized cooling** — for uniform temperature. Controlled circulation lengthens valve life.

★ **Multiple cylinder heads** — prevent warping, make servicing easy.

★ **Diesel economy** — operates for pennies an hour, on a minimum of low-cost diesel fuel.

BRIEF SPECIFICATIONS

Carry capacity (4 MPH)	6,500 lbs.
Lift capacity (0 MPH)	13,000 lbs.
Max. HP	100
Forward speeds (3)	0 to 23 MPH
Reverse speeds (3)	0 to 23 MPH
Tires (std.)	16.00 x 24 — 12 ply
Overall height	7'3"
Width over hubs	94½"
Turning radius	20'
Weight (without tire fill)	18,120 lbs.

totally balanced for:

GREATER WORK OUTPUT

Balanced power-to-weight ratio . . . exactly the right combination of engine power, traction and machine weight . . . insures top all-around efficiency . . . with minimum wheel slippage, maximum fuel economy.

FASTER, SMOOTHER OPERATION

Balanced weight distribution, with 60% of empty weight on rear wheels, provides greater ground-gripping traction. No bucking or raising rear wheels off ground. This, combined with torque-converter drive and powerful breakout, gets heaping loads fast. New power-shift linkage gives more efficient control of operating speeds.

LONGER LIFE

Case balanced construction results in less strain on engine and transmission, less wear on tires. All-welded channel subframe, heavy steel axles and cross-braced loader assembly provide maximum strength and rigidity.

EASIER SERVICING

Brake, electrical and steering systems are all easily accessible by merely removing front cover plate. Multiple engine cylinder heads and removable wet-type sleeves permit servicing without pulling engine.

SAFER HANDLING

Note that the W-10 loader arms are pivoted *ahead* of operator. This exclusive feature gives unequalled visibility, plus maximum operator safety. Better weight distribution, low center of gravity and wide-tread stability mean greater safety and permit moving bigger loads at higher speeds . . . less bouncing.

LOWER COST

With all its advanced features, the W-10 is priced *lower* than its nearest competitor. That's because Case builds the entire machine. Unit construction also means one warranty, one service source . . . no split responsibility.

INTERCHANGEABLE ATTACHMENTS FOR EXTRA YEAR 'ROUND PROFIT

Buckets to fit the job, from 1¼-cu. yd. heavy duty up to 3½-cu. yd. light material. 2-cu. yd. SAE rated standard.

Pallet fork and concrete block fork. Lifts 5,000 lbs. to 10 ft.

Brush rake. Clears, carries and stacks trees, brush.

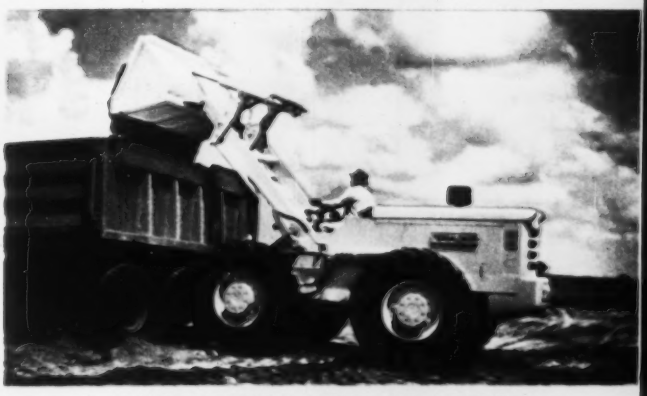
Snow plows. Angling and V-types.

Dozer blade. For backfilling, leveling and grading work.

All-weather cab. Glass enclosed. Heater also available.

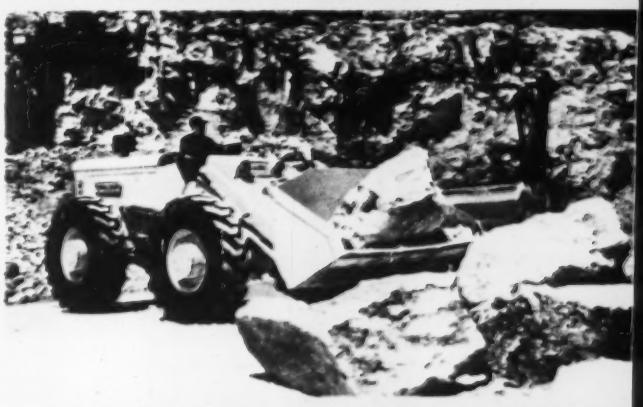
See how the W-10 can cut your costs on jobs like these...

ASK FOR A FREE DEMONSTRATION

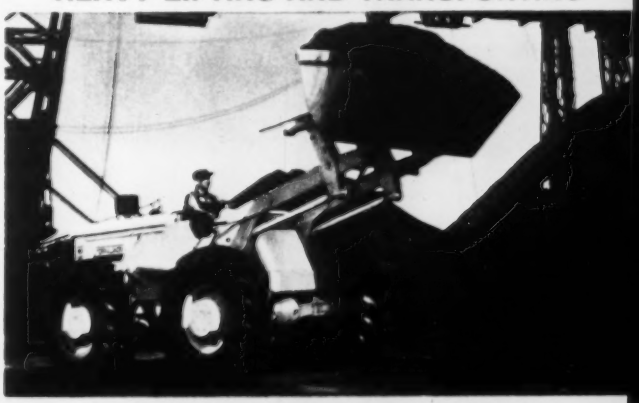


EXCAVATING AND LOADING

GRADING AND BACKFILLING



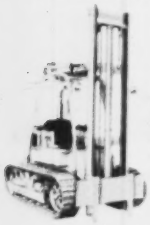
HEAVY LIFTING AND TRANSPORTING



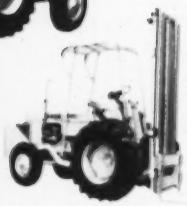
HANDLING BULK MATERIALS

W-9 Terraload'r. 6000-lb. capacity, 4-wheel-drive, rear-wheel power-steer. 1¼, 1¾ or 2¾-cu. yd. bucket. Gas or diesel engine. Torque converter. Power-shift transmission.

W-5 Terraload'r. 3000-lb. capacity, front-wheel-drive, rear-wheel power-steer. 1 or 1½-cu. yd. bucket. Torque-converter drive. Power-shift.

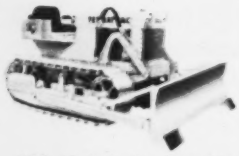


M-38 3500-lb. capacity fork lift. 9', 14'3" or 21'4" mast. 50 hp* gas engine. Torque converter. 3-speed gear transmission. Improved total-contact differential steering.

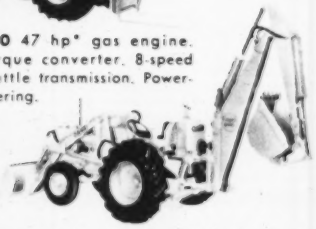


M-420 4000-lb. capacity fork lift. 9½', 14'3" or 21'6" mast. 47 hp* gas engine. Torque converter. 8-speed shuttle transmission. Power-steer.

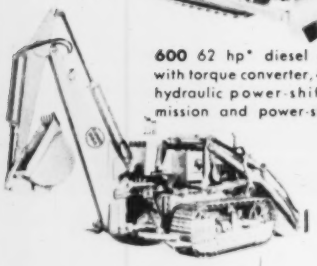
420 42 hp* gas engine. Ferrometallic clutch. 3-speed gear transmission. Improved total-contact differential steering.



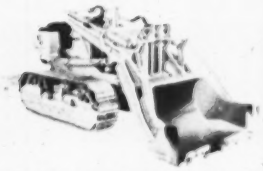
420 47 hp* gas engine. Torque converter. 8-speed shuttle transmission. Power-steering.



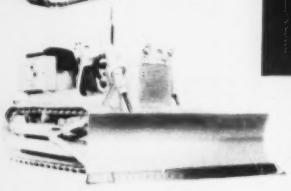
520 50 hp* gas or 45 hp* diesel engine. Torque converter. 3-speed gear transmission. Improved total-contact differential steering.



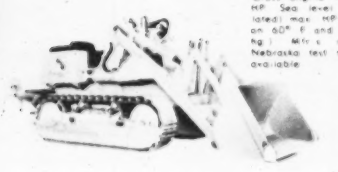
600 62 hp* diesel or gas, with torque converter, 4-speed hydraulic power-shift transmission and power-steering.



1000 100 hp* diesel engine. Case Terramatic Drive. Torsion-bar suspension.



800 80 hp* diesel engine. Case Terramatic® Drive. Torsion-bar track suspension.

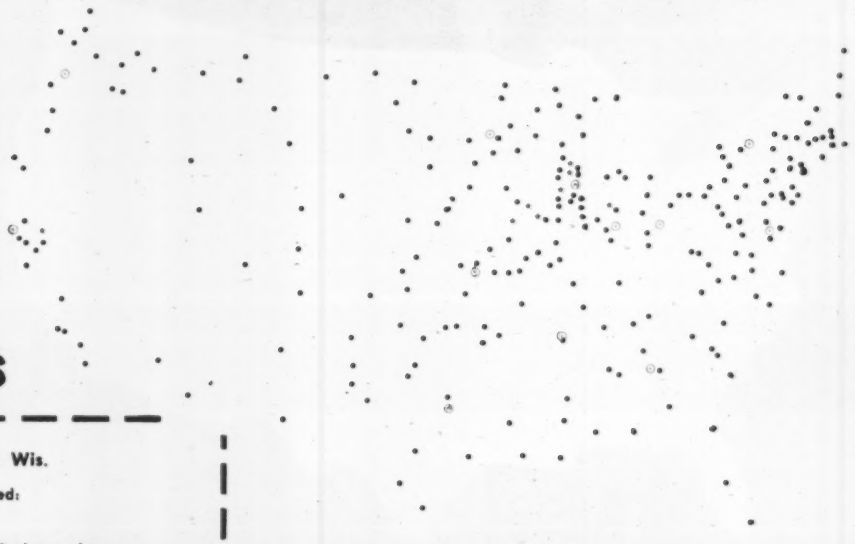


*Gross engine flywheel HP. Sea level ratings rated: max. HP based on 60° F. and 29.92" hg. Mfr's. rating Nebraska test not yet available.

The new CASE W-10

• Industrial Dealers ◎ Factory Branches ★ Manufacturing Plants

BACKED BY NATIONWIDE manufacturing, sales, parts and service facilities



J. I. CASE CO., Dept. G1419, Racine, Wis.

Send free descriptive literature on items checked:

☐ New W-10 Terraload'r.

☐ _____ Case unit shown above.

Name ..... Title .....

Company .....

Address .....

City ..... State .....

C-TL-338N Litho in U.S.A.

Your local Case Industrial Dealer has factory-approved equipment and factory-trained mechanics to service the machines he sells. In addition, the nationwide network of 8 Case factories, and 12 strategically-located branches assures you of prompt, efficient repair parts service whenever and wherever needed.

CONSTRUCTION REPORTS
Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 22 Maine

STREETS AND ROADS

July 23 New Hampshire

HEAVY CONSTRUCTION—LB & CA

▲† U. S. Eng., 424 Trapelo Rd., Waltham, Mass., abandoned missile facilities, FY59, Ethan Allen Air Force Base because of realignment of Air Defense Programs, ENG-19-016-59-134, WINOOSKI, VT., $3,500,000-$4,500,000. CD 6/29, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 21, 29 New Jersey — August 6 New York
August 7 Pennsylvania

STREETS AND ROADS

July 21, 28, 29, 30 New Jersey — July 22 Delaware
July 31, August 7 Pennsylvania — August 6 New York

BUILDINGS—LB & CA

▲ Vermilya-Brown Co., Inc., 100 E. 42nd St., New York 17, N. Y., CA $6,916,043, general contract HOSPITAL, NEW YORK, N. Y., Roosevelt Hospital, 59th St., New York 19, N. Y. Bids June 25. CD 6/19.

▲ Manor Homes, Inc., 450 Broad Ave., Leonia, N. J., Owner Builds, $4,500,000, 400-unit APARTMENT, Grove St., CLIFTON, N. J. OD 4/20.

▲ Terminal Constr. Corp., Hy. 17, Wood-Ridge, N.J., CA $3,815,000, PARKING GARAGE at Military Park, NEWARK, N. J. Newark Parking Auth., 605 Broad St., Newark, N. J. Bids Apr. 6. CD 4/10, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 22 Louisiana — July 28 Florida
July 31 Virginia

STREETS AND ROADS

July 22 Louisiana — July 24 Kentucky
July 28 Florida — July 31 Virginia

BUILDINGS—BA

▲† Fla., Ocala—POST and COURT HOUSE—BA 8/12—P. Bldg. Service, General Service Admin., Rm. 854, Peachtree-Seventh Bldg., 50 Seventh St. N.E., Atlanta, Ga.; United States Post Office and Court House (except elevator). Proj. 08902 PCAE. CD 4/10/58.

HEAVY CONSTRUCTION—LB & CA

▲ Sullivan, Long & Hagerty, 801 5 Ave. N., Birmingham, Ala., CA $3,047,800, sewage treatment plant Project MES 15-12, JACKSONVILLE, FLA. City, City Hall, Jacksonville, Fla. Bids June 16. CD 6/22, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 21 Ohio — July 24 Illinois
July 28 Wisconsin

STREETS AND ROADS

July 21 Ohio — July 24 Illinois
July 28 Indiana, Wisconsin

▲ O., Batavia—BA 7/27—Comrs. Clermont Co., water treatment plant and distr. sys. in eight separate sections. $3,100,000. Plans deposit $30 each. CD 6/8/56.

BUILDINGS—BA

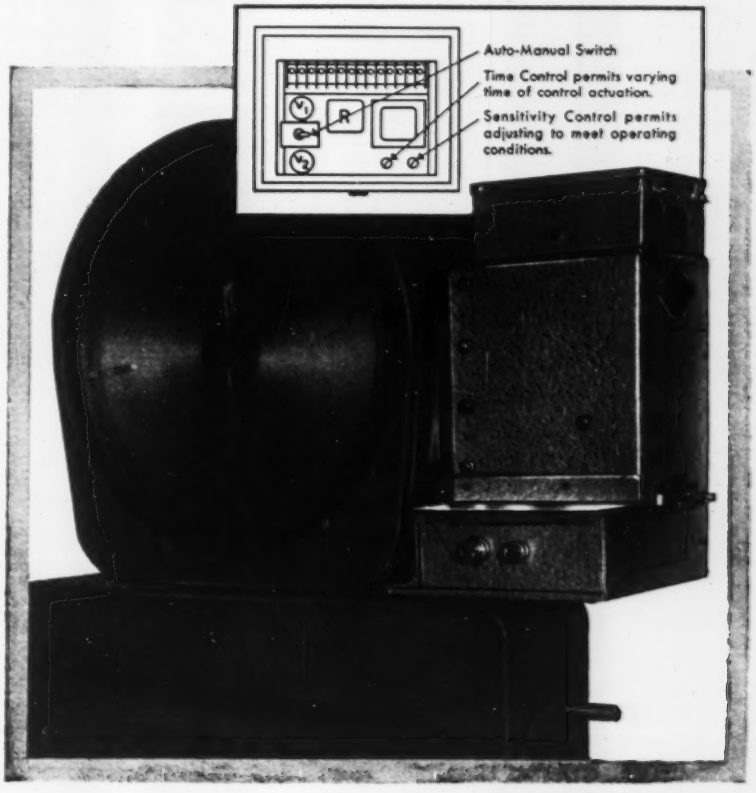
▲ Ill., East St. Louis—HOUSING—BA 12/22—East St. Louis Housing Auth., 810 Spivey Bldg., housing: four 8 story and forty-five 2 story, 4-family bldgs., Missouri Ave., 13th and 16th Sts. and Broadway. $8,000,000. Joseph D. Standish, 710 Spivey Bldg., archt. Joseph Goldenberg, 624A Missouri Ave., engr. CD 7/16/58, under LB.

HEAVY CONSTRUCTION—LB & CA

▲† Five-Boro Constr. Co., 2 La Fayette St., New York N. Y., CA $3,512,537, air dormitories, Richard I. Bong Air Force Base, ENG-11-032-59-85, KANSASVILLE, WIS. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids June 23, awarded June 30. CD 6/29, under LB.

▲† U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill., abandoned BOMARC missile facilities at Truax Air Force Base because of realignment of Air Defense Program, MADISON, WIS. $7,500,900-$8,000,000. CD 4/28.

NEW Fairbanks-Morse Electronic Weight Detector


Auto-Manual Switch
Time Control permits varying time of control actuation.
Sensitivity Control permits adjusting to meet operating conditions.

Prevents incorrect weighing . . . stops costly errors!

With the new Electronic Weight Detector, true weight of any load can be automatically obtained and recorded without need of a weighman. Where a weighman is used, it is impossible for him to record incorrect weights or start a sequence at the wrong time. When desired, a flip of the switch can disengage the Weight Detector entirely from the system. *This is the first fully-reliable control of its kind available in the scale industry.*

To completely automate your weighing—to be sure that your weights are correct—to protect yourself by completely policing your entire weighing operation—contact your nearby Fairbanks-Morse Field Engineer, or write directly to Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois for complete information.

See Sweet's Plant Engineering File for full line of F-M Scales

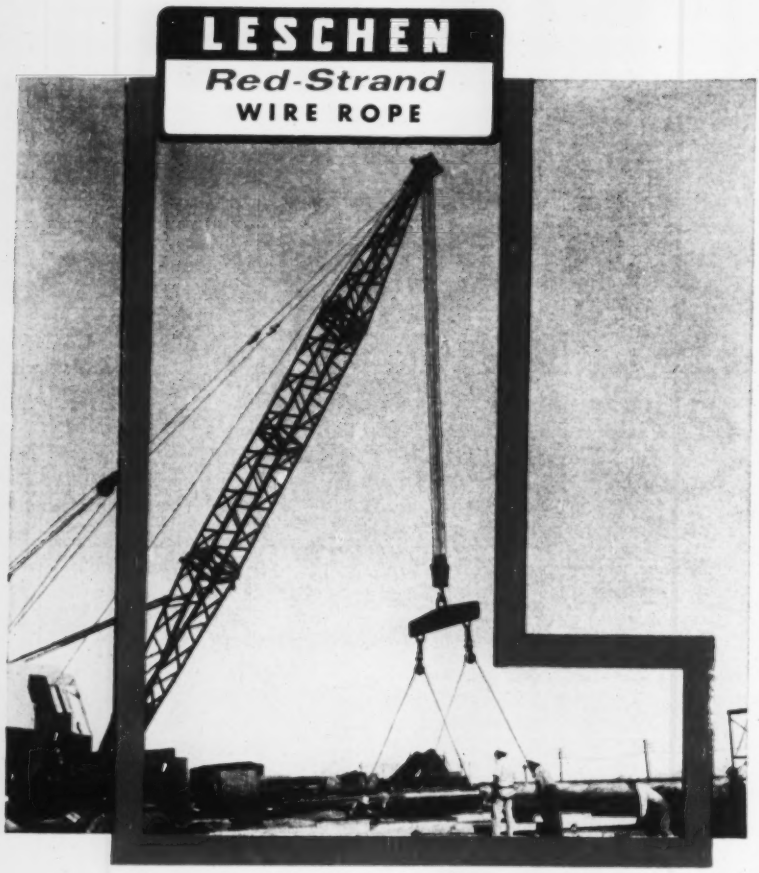
FAIRBANKS-MORSE

a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL, DUAL FUEL AND GAS ENGINES • ELECTRIC MOTORS GENERATORS • COMPRESSORS • MAGNETOS • HOME WATER SYSTEMS

when the going gets rough-

give 'em "L"



When the load is on the crane, you'll be glad you rigged with *Leschen*—the wire rope that's the same top quality in every foot of every reel. The new Leschen wire mill is designed to deliver exactly that. New machines . . . new processes . . . exclusive new continuous-flow technique—all as modern as tomorrow. Try Leschen Red-Strand Wire Rope now and see how its uniform quality makes your operation safer, your replacement time farther in the future. Make your next order Leschen! *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

LESCHEN WIRE PORTER ROPE DIVISION

H.K. PORTER COMPANY, INC.

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Copper and Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

BUILDINGS—LB & CA

▲ **Sauter Development Co.**, 1727 Portage Trail, Cuyahoga Falls, O., Owner Builds, $5,000,000, 250 HOMES, Silver Crest Estates Area, Graham Rd., Englewood, Lillian Rd., STOW, O.

▲ **Pathman Constr. Co.**, 1735 W. Fullerton Ave., Chicago, Ill., CA $8,000,000, FACTORY, metal working plant, sewerage, water, oil storage, Rte. 141, MUNSTER, IND. Simmons Co., 5513 5 Ave., Kenosha, Wis. Awarded July 6. A. Epstein & Sons, 2011 W. Pershing Rd., Chicago, Ill., archts.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 30 Missouri

STREETS AND ROADS

July 21 Kansas, Minnesota July 22 Arkansas
July 30 Missouri

HEAVY CONSTRUCTION—LB & CA

▲† **List & Clark Constr. Co.**, 2 West 40th St., Kansas City, Mo., CA $2,575,653, est. $2,627,719, Pomona Dam and Reservoir (Stage 1), clearing, grubbing, embankment, outlet works, diversion channel excav., etc. near Ottawa, ENG-23-028-59-102, KANSAS. U. S. Eng., 1800 Federal Office Bldg., Kansas City, Mo. bids June 3. CD 6/8, under LB.

BUILDINGS—LB & CA

▲† **Millstone Constr. Co.**, 8510 Eager Rd., St. Louis 17, Mo., CA $7,733,000, general contract FEDERAL OFFICE BLDG., ST. LOUIS, MO. General Services Admin., P. Bldgs. Service, 2306 East Bannister Rd., Kansas City 10, Mo. Bids June 23. CD 6/25, under LB.

▲† **McCarthy Brothers Constr. Co.**, 4903 Delmar Blvd.; MacDonald Constr. Co., 1310 S. Grand Blvd. and **Fruin-Colnon Contg. Co.**, 1706 Olive St., all St. Louis, Mo., CA $4,294,940, general contract FEDERAL RECORDS CENTER, ST. LOUIS, MO. General Services Admin., P. Bldgs. Service, 2306 Bannister Rd., Kansas City 10, Mo. Bids June 18. CD 6/23, under LB.

▲ **J. W. Bateson**, 10130 Monroe St., Dallas, Tex., CA $4,463,500, U. S. COURT HOUSE AND FEDERAL OFFICE BLDG., OKLAHOMA CITY, OKLA. General Services Admin., 714 Commerce St., Dallas, Tex. CD 6/18, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

July 30, August 5 California

STREETS AND ROADS

July 29, 30, August 5, 6 California

▲ **California**—BA 7/29—State Dpt. Water Resources, 1120 N. St., Sacramento, boring, lining, grading two tunnels to relocate Western Pacific R.R. tracks near Oroville. $8,700,000. CD 3/27/57.

BUILDINGS—BA

▲ **Calif., Chino**—YOUTH TRAINING SCHOOL—BA 8/19—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Phase II permanent facilities, Chino Youth Training School, California Youth Auth., incl. greenhouse, auto and machine shop, shops bldg., chapel, automotive storage bldg., receiving warehouse, commissary addn., auditorium, housing unit, employees apartment bldg. with carports, W. O. 3514GC. $3,000,000. Plans deposit $150. CD 12/4.

BUILDINGS—LB & CA

▲+ **Diversified Bldrs., Inc.**, 6855 E. Rosecrans St., Paramount, Calif., CA $3,475,000, SODIUM BOILER PLANT and fuel-cycle facility at experimental breeder reactor testing station, Inv. AT(10-1)-1002, ARCO, IDAHO. Atomic Energy Comm., Idaho Operations Office, P. O. Box 2108, Idaho Falls, Idaho. Bids May 20. CD 5/27, under LB.

▲ **Chesin Constr. Co.**, 6536 E. 22 St., Tucson, Ariz., Own Forces, $40,000,000, 600 RESIDENCES, Oracle Heights Estates, West Ina Rd. northwest of Tucson; 180 homesites Glenn Heights, North Swan Rd. at East Glenn St.; 1,350 homes Manana Grande, South Kolb Rd. at East 22 St., TUCSON, ARIZ.

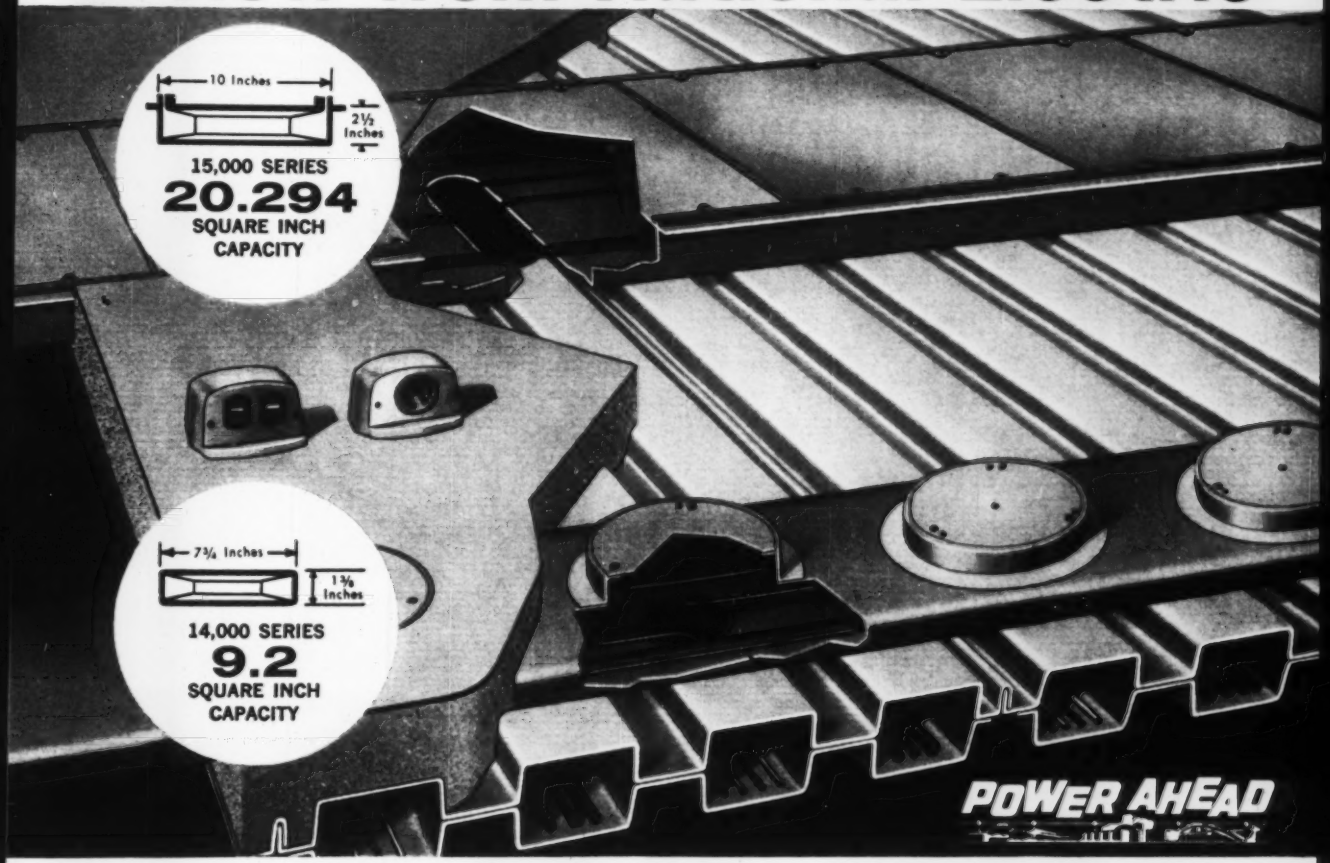
▲ **Hoffman Constr. Co.**, 715 SW Columbia, Portland, Ore. CA Total est. $10,000,000-$15,000,000, KRAFT PULP AND PAPER MILL ADDN., TOLEDO, ORE. Georgia-Pacific Corp., Equitable Bldg., Portland, Ore. CD 6/5.

▲ **James I. Barnes Constr. Co.**, 1114 Montana Ave., Santa Monica, Calif., LB $3,810,000, (8 bidders), 6 story, rein.-con. GRADUATE SCHOOL OF BUSINESS ADMINISTRATION, at University, LOS ANGELES, CALIF. University of California, 405 Hilgarde Ave., Los Angeles, Calif. Bids July 7. CD 6/5.

▲+ **Heers Assocs.**, P. O. Box 2187, Riverside, Calif., CA $11,332,820, 481 unit Capehart HOUSING at Shafter No. 2, and 385 unit Capehart HOUSING at Schoefield Barracks No. 2, HONOLULU, HAWAII. U. S. Eng., P. O. Box 224, Honolulu 4, Hawaii. Bids Apr. 16. CD 4/22, under LB.

(Continued on page 139)

New from National Electric



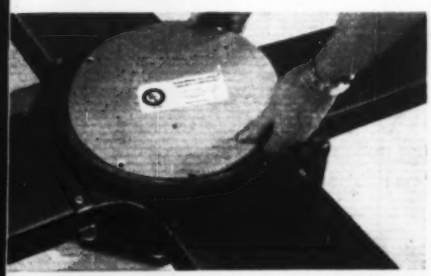
TWO NEW STANDARD-DESIGN HEADERDUCT SYSTEMS NOW OFFER...

Selected for new $45 million Kaiser Center, Oakland, Calif. NE systems proved flexible enough to meet unique construction requirements and tremendous telephone feeder system wiring load. Welton Beckett & Associates, Architect and Consulting Engineers. Foothill Electric Company, Electrical Contractors.

LARGEST CAPACITY DUCT AVAILABLE

- Greatest wire capacity of any Headerduct provided in a standard design
- Greatest wire capacity at all feed points
- Fast installation—easy fishing. Quick access to entire system
- Strongest service fittings of any system
- Attractive modernistic design of service fittings harmonizes with modern as well as traditional architecture
- Most complete line of telephone service fittings
- U L listed for *all* approved cellular steel floors
- Application engineering available

For complete information, write: *National Electric Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

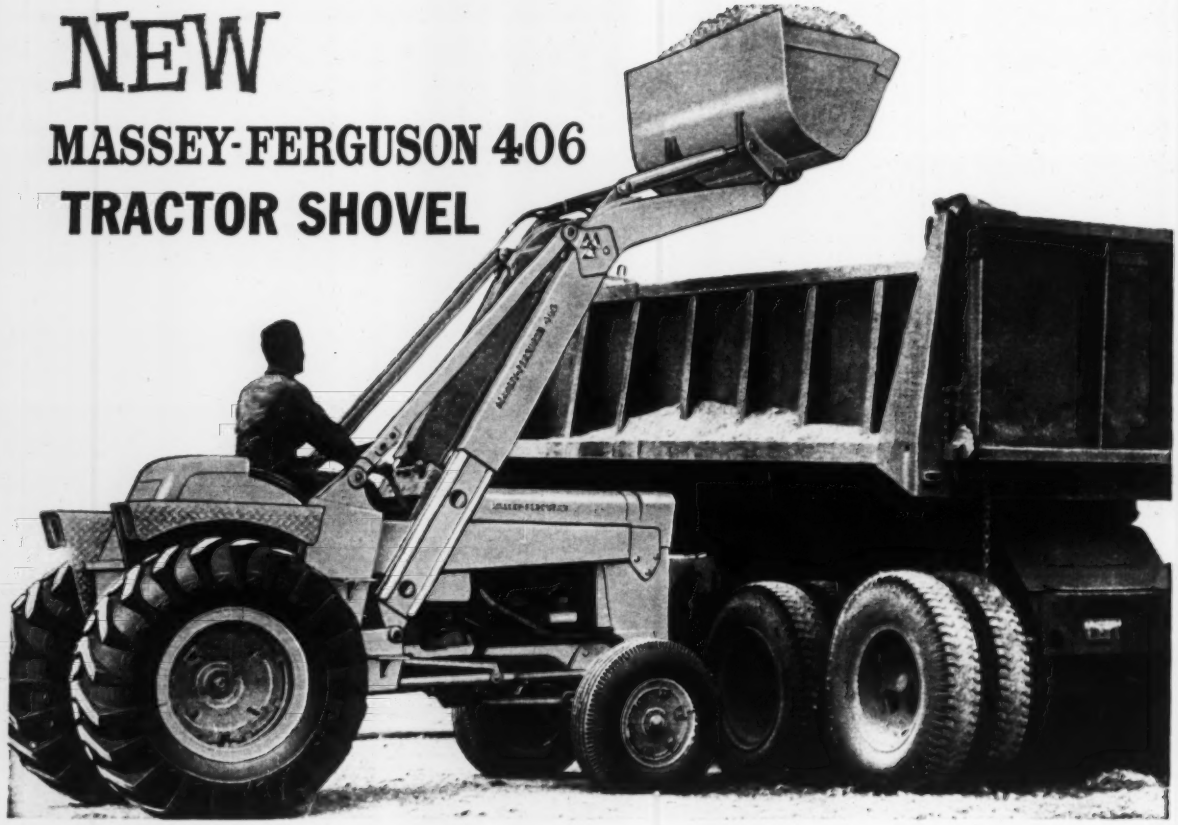


New large capacity cross box for the 14,000 Series has 11¼ inch opening for access to cells. Adjustment for 2⅛ to 2⅞ inch concrete depth.

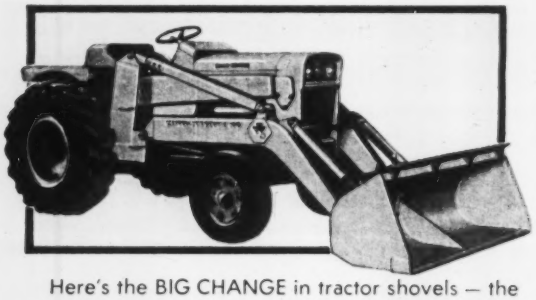
NATIONAL ELECTRIC DIVISION PORTER **H.K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Copper and Alloys—RIVERSIDE ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

NEW
MASSEY-FERGUSON 406 TRACTOR SHOVEL



more loads... better loads... greater profits... because



Here's the BIG CHANGE in tractor shovels — the all-new, streamlined Massey-Ferguson 406 1 cu. yd. tractor shovel. Now you increase your capacity with less investment. This rig does more BIG work in a day than machines that cost 50% more...yet it handles your utility jobs economically and efficiently.

JUDGE FOR YOURSELF

ask for a Trial Demonstration without Obligation

Compare and weigh the facts. Ask your Massey-Ferguson Industrial Dealer for a demonstration. You'll see it's worth buying.

X ***instant reversing***
Means faster cycling — no shifting no clutching...no levers to pull

X ***up-front visibility***
See at all angles — front, rear, both sides

X ***low thrust point —***
for direct push into the load, but high reach — 126" at hinge point

X ***compare***
Price...quality...performance

There's loading power at your finger tips...speed and directional control at the touch of your toe...and maximum visibility wherever you go. Instant reversing, low thrust point, high reach are just a few of its features. Integrated attachments — including the famous Davis Backhoe — give it unparalled versatility.

MASSEY-FERGUSON INDUSTRIAL DIVISION
Block 1000 South West Street • Wichita 13N, Kansas

(Continued from page 136)

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
August 6 British Columbia

▲ Ont., Toronto—RAPID-TRANSIT SUBWAY—BA 8/31—Toronto Transit Comn., 1900 Yonge St., Structural Contr. U-2, 5,320 lin. ft. subway in tunnel, two station sections, University section rapid-transit subway; Structural Contr. U-3, 3,425 lin. ft. subway structure, two station sections, Bloor St. section rapid-transit subway. W. S. Atkins & Assocs. Ltd., 33 Price St., Toronto, engr. for Structural Contr. U-3 and tunnel work, Structural Contr. U-2. Plans deposit $100 each. CD 5/15.

BUILDINGS—BA

▲ Ont., Toronto—BREWERY—BA 7/22—Carling Breweries Ltd., 1047 Yonge St. (selected list of bidders) superstructure for brewery, brew house, storage and fermentation bldg., shipping facilities, draft beer bldgs. and powerhouse. Hys. 401 and 27. $3,000,000. CD 6/10/57.

▲ Ont., Toronto—ARTS, etc.—BA 8/19—University of Toronto, Simcoe Hall, 300,000 sq. ft. structural steel, poured, rein.-con., brick arts bldg., 6 story residence and 2 story, classroom wing, $5,800,000. Plans deposit $200. John B. Parkin & Assocs., 1500 Don Mills Rd., archts. CD 2/16.

HEAVY CONSTRUCTION—LB & CA

▲ Tide Bay Dredging Co. Ltd., Annacis Industrial Estate Dev., New Westminster, B. C., McKenzie Barge & Derrick Co. Ltd., ft. Victoria Dr., Vancouver, B. C. and General Constr. Co. Ltd., Granville Island, Vancouver, B. C., LB $3,311,939, est. $3,000,000, two mi. rock-filled causeway, two breakwaters, 1,000 ft. and 1,200 ft., Contract No. 1, Tsawwassen Ferry Terminal, Tsawwassen (Point Roberts), VANCOUVER, B. C. Govt. of British Columbia, Victoria, B. C. Bids June 23. CD 6/17.

▲ Canada Iron Foundries Ltd., Eastern Ave., Toronto, Ont., CA $3,867,972, 22,000 tons c.i. tunnel lining for University Ave. Rapid Transit Subway, TORONTO, ONT. Toronto Transit Comn., 1900 Yonge St., Toronto, Ont. Bids June 22. CD 6/26, under LB.

▲ Carter Constr. Co. Ltd., 419 Cherry St., Toronto, Ont., CA $3,898,660, Intermediate cantilever hangar, Royal Canadian Air Force Base, TRENTON, ONT. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Awarded June 30. CD 6/24, under LB.

▲ McNamara (Quebec) Ltd., 3901 Namur St., The Key Constr. Ltd., 1040 Bleury St. and Deschamps & Belanger Ltd., 6931 Cote des Neiges Rd., all in Montreal, Que. CA $8,319,797, piers and superstructure, Sections 5 and 7A, Champlain Bridge over Nun's Island, MONTREAL, QUE. National Harbors Bd., West Block, Parliament Bldgs., Ottawa, Ont. Bids Apr. 14, awarded June 30. CD 6/12, under LB.

BUILDINGS—LB & CA

▲ Fluor Corp. of Canada, Ltd., 207 Royalite Bldg., Calgary, Alta., CA $3,500,000, GAS PROCESSING PLANT, near CARSTAIRS, ALTA. Carstairs Operators' Committee, Calgary, Alta. Fluor Corp. Ltd., 2500 S. Atlantic Blvd., Los Angeles 22, Calif., U. S. A., engrs.

▲ Gilpin Constr. Co. Ltd., and H. J. Kaiser Co. Canada Ltd., 1030 W. Georgia, Vancouver, B. C., CA $3,000,000, total est. $50,000,000, back fill and form work, concrete and masonry walls for PULP and SAWMILL, CASTLEGAR, B. C. Celgar Ltd., 1030 W. Georgia, Vancouver, B. C. Bids Mar. 9, awarded June 26. CD 3/3.

▲ Foundation Co. of Canada Ltd., 1220 Bay St., Toronto, Ont., CA steel and iron PLANT and erecting equipment, TADANAC, B. C. Consolidated Mining & Smelting Co. of Canada, Ltd., Trail, B. C. Total est. $20,000,000. CD 5/5, under B. C., Kimberly; Lurgi Gesellschaft, Frankfort, Germany, CA sintering equipment (Tadanac, B. C.); Elektrokemisk, Oslo, Norway, CA first electric pig iron furnace (Tadanac, B. C.).

▲ Leonard Constr. Co., 37 S. Wabash Ave., Chicago 3, Ill., CA $5,500,000, zinc sulphide roasting and sulphuric acid PLANT, MAITLAND, ONT. Sherbrooke Metallurgical Co. Ltd., subsidiary of Matthiessen & Hegeler Zinc Co., 9th and Sterling Sts., LaSalle, Ill., U. S. A. Awarded July 2.

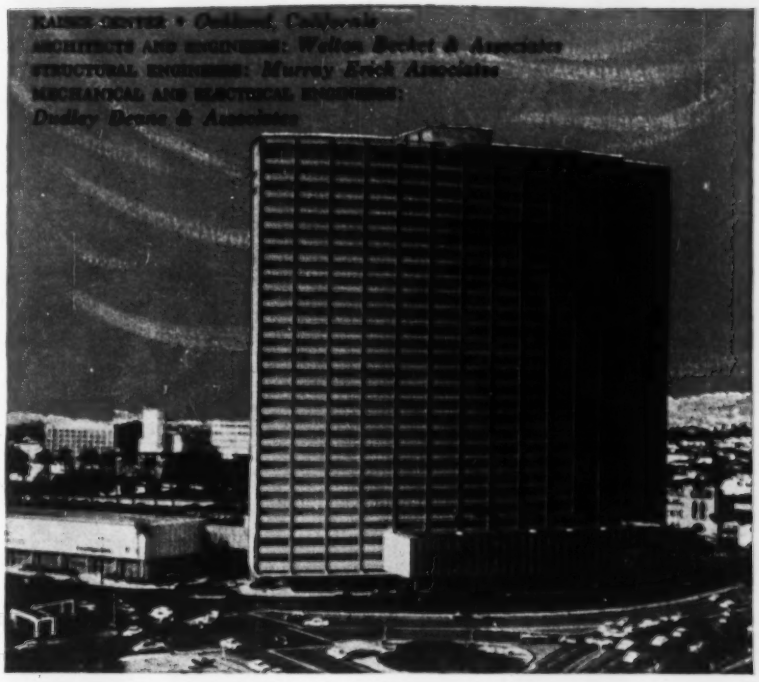
AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ Oman Constr. Co., Acklen Park, Nashville, Tenn., U. S. A., Farnsworth & Co., Inc., 1515 S. Salcedo, New Orleans, La., U. S. A., and Wright Contg. Co., Brookhaven Rd., Columbus, Ga., U. S. A., CA $22,173,000, addnl. airport constr. work, PAKISTAN. U. S. Eng., APO 271, New York, N. Y., U. S. A. Awarded June 10.

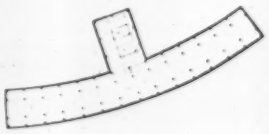
▲† Oman Constr. Co., Acklen Park, Nashville, Tenn., U. S. A., R. P. Farnsworth & Co., Inc., 1515 S. Salcedo, New Orleans, La., U. S. A., and Wright Contg. Co., Brookhaven Rd., Columbus, Ga., U. S. A., CA $3,979,000, terminal and facilities Dhahran Airport, DHAHRAN, SAUDI ARABIA. U. S. Eng., APO 271, New York, N. Y., U. S. A. Awarded June 15.

(Proposal Advertisements see pp. 156 to 158)


RAINIER CENTER • Oakland, California
ARCHITECTS AND ENGINEERS: Welton Becket & Associates
STRUCTURAL ENGINEERS: Murray Erick Associates
MECHANICAL AND ELECTRICAL ENGINEERS:
Dudley Deane & Associates

Floor areas electrified in the West's largest office building

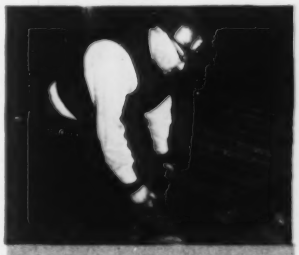
Milcor Celluflor anticipates tomorrow's electrical load in new Kaiser Center



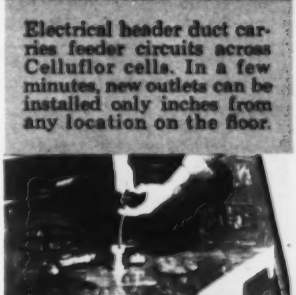
Here, to provide unlimited electrification at low cost — and meet the challenging construction requirements of a fan-shaped floor layout — the architect has combined four types of Milcor Celluflor panels.

The underfloor cells serve as raceways to handle the complex cable systems required by communications systems and electronic office equipment in this 28-story building. And—there's electrical capacity to spare!

There are other advantages of Celluflor — savings of steel, footings, and construction time. See Sweet's Architectural File, section 2a/In — or write for catalog 270.



Electrical header duct carries feeder circuits across Celluflor cells. In a few minutes, new outlets can be installed only inches from any location on the floor.



MILCOR® Celluflor

INLAND STEEL PRODUCTS COMPANY Member of the Steel Family
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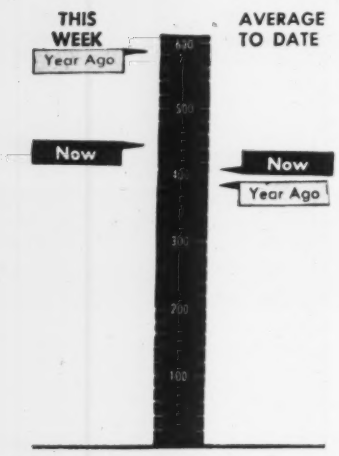
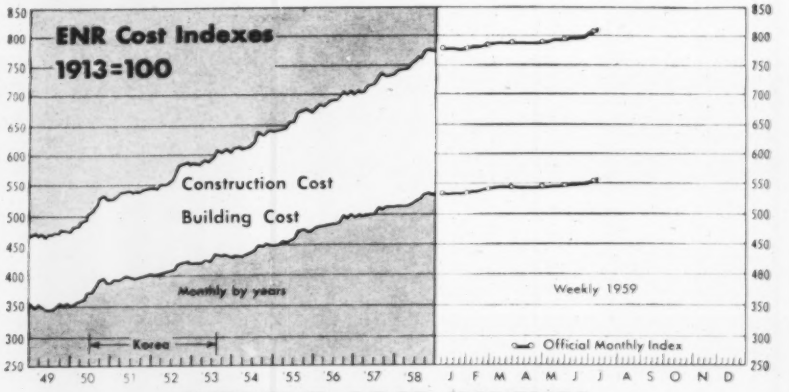
ATLANTA, BALTIMORE, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, DALLAS, DENVER, DETROIT, KANSAS CITY, LOS ANGELES, MILWAUKEE, NEW ORLEANS, NEW YORK, ST. LOUIS, ST. PAUL.
C-16

Construction Scoreboard

CONTRACTS ...





CURRENT COST INDEXES

ENR INDEXES (1913=100), 20-cities' average	Week of July 9 1959	% Change from June 11 1959	% Change from July 10 1958
Construction Cost	807.83	+1.2	+5.9
Building Cost	552.69	+0.7	+5.4

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.836
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518

AMOUNT OF CONTRACTS LET

	This Week millions	Cum. 29 wks 1959 millions	Cum. 29 wks Chge '58-'59 %
All Heavy Constr.	$446.6	$11,816.9	+ 5
By Ownership			
PRIVATE	228.1	5,817.6	+24
PUBLIC	218.5	6,029.3	− 9
State & Municipal	139.1	4,209.9	− 9
Federal	79.4	1,819.4	− 7
By Type of Work			
PUBLIC			
Waterworks	6.0	258.7	+53
Sewerage	18.6	382.6	+12
Bridges*	7.9	340.2	− 10
Highways	57.1	1,767.4	− 2
Earthwork Dams, & Waterways	14.8	472.6	−30
Buildings			
Excl. Housing	77.6	1,529.4	+ 2
Housing	0.7	448.5	−47
Unclassified	35.8	836.9	− 5
PRIVATE			
Buildings			
Mass Housing	136.6	2,704.9	+20
Commercial	39.9	1,262.2	+15
Industrial	45.5	1,562.8	+47
Unclassified	6.1	280.7	+ 8

*Includes private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

CAPITAL . . .

New Capital For Construction	Week of July 9 millions	Cum. 28 wks 1959 millions	Cum. 28 wks Chge '58-'59 %
Corporate Securities	$71.3	$2,222.7	−25
State and Municipal:			
All Except Housing	44.1	3,539.1	− 5
Housing	....	49.0	+45
Federal Loans	6.4	87.7	−20
Federal Aid	....	18.0	....
Total Nonfederal	$121.8	$5,916.6	−13
Federal Appropriations:			
Projects in U. S.	....	$38.3	−95
Outside U. S.	....	....	−100
Total New Capital	$121.8	$5,954.8	−22

CONTRACTS AWARDED

	1959 June (millions)	1959 6-Mos. (millions)	% Change from 1958 June	% Change from 1958 6-Mos
Total U. S., ENR reported	$1,876.6	$10,347.8	− 1	+ 7
Private	909.1	5,031.6	+43	+21
Public	967.4	5,316.2	−24	− 3
State and Municipal	702.5	3,750.0	−15	− 6
Federal	264.9	1,566.2	−40	+ 7
ENR Volume Index, 1913=100	650	567	− 2	+ 4

NEW CONSTRUCTION CAPITAL

Total U. S.	$793.7	$5,473.4	−23	−26
State and Municipal Bond Sales	322.2	3,209.2	−21	−12
Corporate Security Sales	405.7	2,135.9	+ 2	−24
Federal Loans, Aid (nonfederal work)	27.5	90.0	+149	− 2
Federal Appropriations (federal work)	38.3	38.3	−82	−95

MATERIALS SHIPMENTS

	Unit	1959 Mar. (M) Spril (A) May (M)y	Cum. No. of Mos.	Percent Change from Year Ago Mo.	Percent Change from Year Ago Cum.
Portland Cement, Bur Mines	thous bbls	32,992 (M)y	115,339 (5)	+ 8	+13
Conc Paving Awards, PCA	thous sq yd	9,338 (M)y	41,485 (5)	−20	− 3
Fabricated Structural Steel	thous tons	294 (M)y	1,286 (5)	−10	−19
Bookings, AISC	thous tons	241 (M)y	1,321 (5)	+ 8	+35
Reinforcing Bars, Net, AISI	thous tons	257 (M)y	1,048 (5)	+34	+43
Lumber, NLMA	mil fbm	3,221 (M)y	14,899 (5)	+10	+14
Orders	mil fbm	3,224 (M)y	15,095 (5)	+11	+16
Production	mil fbm	3,163 (M)y	14,495 (5)	+13	+13
Clay Products, Bureau of Census					
Brick, Ungl, Common, Face	mil bri	597.7 (M)	1,351.4 (3)	+37	+28
Vitrified Clay Sewer Pipe	thous tons	153.4 (M)	384.6 (3)	+34	+34
Structural Tile, Unglazed	thous tons	40.1 (M)	118.7 (3)	− 3	+ 8
Asphalt Products, Bureau of Census					
Asphalt Roofing	thous sales sqs	3,984.9 (A)	16,998.2 (4)	−23	+20
Asphalt Siding	thous sales sqs	53.3 (A)	284.8 (4)	−36	+12
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate (non-heat treatable)	mil lbs	116.5 (A)	393.7 (4)	+44	+41
Wire and Cable	mil lbs	25.5 (A)	95.8 (4)	+15	+13
Extruded Shapes (soft alloys)	mil lbs	76.7 (A)	259.6 (4)	+49	+36

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	2,840 (M)y	2,502 (5)**	+ 6	+ 4
Contractor Failures, Dun & Bradstreet					
Number		172 (M)y	875 (5)	−17	−10
Liabilities	thous	$12,262 (M)y	47,659 (5)	+14	− 6

**Average per month

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MORE *with* **MARION**

They love Marions in Seattle - - four of them cut memorable paths through sewer projects for this fast-growing city.

This machine is a 43-M used both as a 1½ yard dragline and a 1 yard hoe in sewer work.

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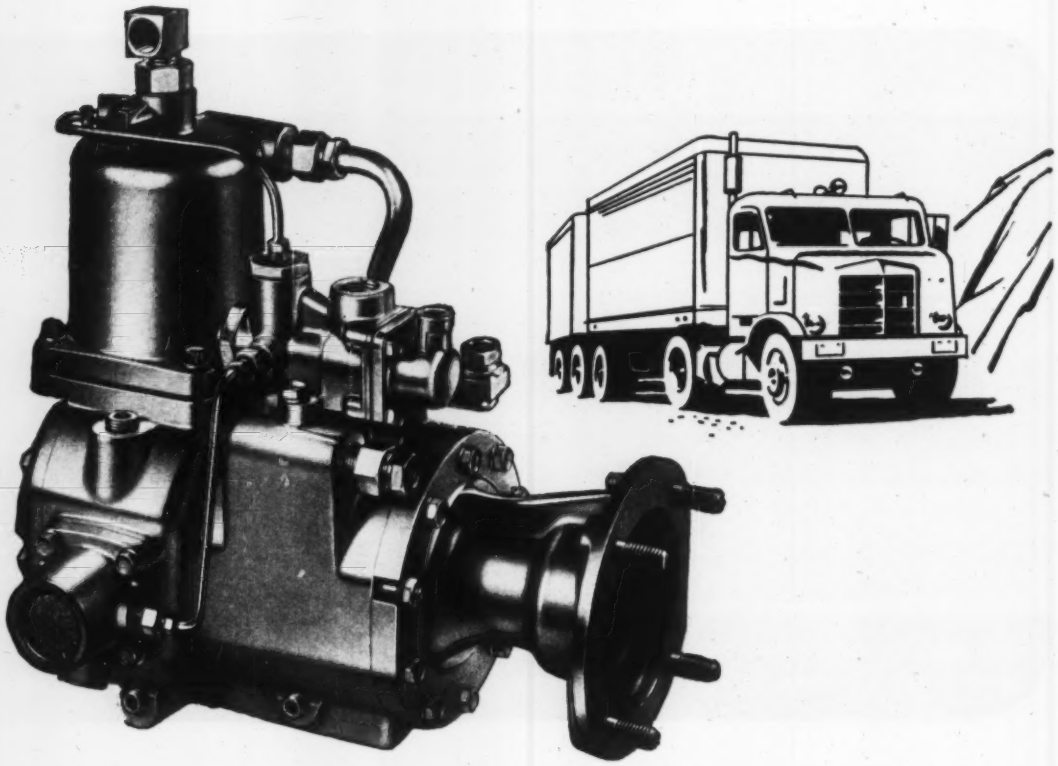
A Division of Universal Marion Corporation

Power shovels, hoes, draglines, clamshells, cranes - - crawler, rubber and walker mounted - - ¾ to 100 cubic yards

More air reserve for safer braking of diesel powered trucks...



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The Wagner Drive-Thru Compressor features all the advantages of rotary compression . . . supplies more air reserve for braking diesel trucks . . . gives rapid air pressure recovery with smooth, quiet, cool operation.

The design of the compressor eliminates the use of thrust absorbing components and makes it possible to use rotary seals with a minimum of seal loading. Improved channeling permits better oil circulation to all moving parts—lengthens the service life of the pump and cuts maintenance.

NEW LUBRICATING VALVE. The lube valve on these units circulates cool engine oil through the compressor during the non-pumping cycle and cools the compressor between cycles by completely changing the oil in the sump. Compressor life is prolonged by constant, adequate lubrication.

For full information on these compressors, write to Air Brake Engineering Department, Wagner Electric Corporation, St. Louis 14, Missouri.

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WK59-B

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Antitrust Suits Hit Subcontractors

Government files criminal, civil suits in Arizona; Cleveland employers act against "sub" organization

Plastering subcontractors' associations in Phoenix and Cleveland are involved in suits based on charges of violating the Sherman Anti-Trust Act. In Phoenix, the U. S. has leveled the charges at the subcontractors' group. In Cleveland, the subcontractors are making the charges against an employers' group.

The Phoenix case is particularly significant. It may develop into a court test of the legality of subcontractors' bid depository plans, which are now coming into wider use (ENR Jan. 29, p. 77).

Federal antitrust charges were filed in Phoenix against the Arizona Consolidated Masonry and Plastering Contractors Association and five of its officers. In companion civil and criminal suits, the U. S. Department of Justice charges the association with four violations of the Sherman Anti-Trust Act since 1951. They are:

- A boycott of general contractors who hire masonry and plastering subcontractors not in the association.
- Refusal to hire masons and plasterers who work for such general contractors or for general contractors doing their own masonry and plastering.
- Adoption of bidding rules that unreasonably restrict bidding by subcontractors and the receipt of bids by general contractors.
- Interference with bid quotations submitted by subcontractors. The government says association members require a man who is low bidder by more than 10% to withdraw his bid in favor of the second lowest bid.

The case, which has been building for more than a year, was precipitated when Michael Guida—a small Phoenix plastering subcontractor—sued the association for $450,000. He claimed its operations were a business deterrent.

The association admits to the practices charged by the government. But, a spokesman says it hopes to prove in court that the practices are legal. Furthermore, association members say, the united bidding plan is the only way subcontractors can keep from being "cut to bits" by building contractors.

The association says its bidding plan is modeled after one in Bakersfield, Calif. It calls for plastering subcontractors to file bids with a central depository—usually a bank. The sub bids are opened shortly before the general contractor must file his general bids. This allows the general little or no time to shop the subs for lower prices.

A somewhat similar bid depository for electrical subcontractors in St. Paul, Minn., was informally approved by the Justice Department last winter (ENR Dec. 25, 1958, p. 124).

The government, in its civil suit, is seeking an injunction against continuance of the practices. The suit also asks the court to enjoin the association from participating in any bid depository where subcontractors' bids are deposited, processed or compared.

If the association decides to plead not guilty and fight the charges in court, the criminal action will probably be heard first. Conviction in the criminal case would make the association, and the officers named in the suit, subject to a maximum fine of $50,000 each.

Officers named are Ace Springfield, Ora Hopper, William Brimingham, Herman Meredith and Leroy Churchill. Mr. Hopper is a plastering subcontractor; the others are masonry subcontractors. Mr. Churchill is president of the association. The other four men are directors or former officers.

The Arizona Consolidated Masonry and Plastering Contractors Association consists of 25 masonry subcontractors and 20 plastering subcontractors. They perform about 75% of all masonry and plastering contracts in Arizona, and last year handled $5.6 million worth of work.

In Cleveland's federal court, the Cuyahoga County Plastering Contractors' Association, Inc., is suing the Employing Lathers Association for violating the Sherman Act. Damages asked total almost $280,000.

The civil suit charges that five large plastering firms, members of ELA, have a contract with Lathers Local 2 (AFL-CIO) permitting them to employ lathers directly from the union. Smaller firms have to hire union lathers through "lathing solicitors," at a cost 10% above union scale, the suit charges.

CCPCA and four contractors—Acme Lathing & Plastering Co., Pedone Lathing and Plastering Co., G. Douglas Jafray Plastering Co., and Joe Latina & Sons Plastering Co.—brought the suit. They ask the court to award triple damages to four contractors and to restrain the defendants from using lathing solicitors or preventing small contractors from hiring union members.

Michigan Can't Pay: Job Halts

The financial crisis in Michigan is now showing up in construction.

Carlson Construction Co., Otsego, Mich., stopped work on a $69,000 state building at Plainwell. It's the first construction company to leave a job under way. After conferring with state officials, the company agreed to stop work temporarily rather than abandon the job, since it is nearly completed.

The company is one of about 16,000 creditors the state can't pay, said Gov. G. Mennen Williams. The state now owes about $4.1 million to contractors, suppliers and other creditors.

Michigan is suffering from a severe general fund shortage (ENR June 4, p. 88). Its financial difficulties continue to increase as the state legislature remains deadlocked over taxation methods and amounts needed.

The money shortage is limited to facilities and services paid for out of the state's general fund. But even construction paid for out of separate and pledged funds may be hurt by the state's fiscal woes.

For example, highway bonds are backed by gas and truck weight taxes and placed in a special fund. Yet the state highway department expects trouble in selling $50 million in highway bonds on July 30. It will market the bonds to help finance 37 projects costing $521 million. The bonds are the first of $250 million worth needed for the state's five-year, $1.2-billion highway construction program.

Because of Michigan's financial distress, the state will probably have to pay more than 4% interest on the new bonds, says highway finance director Alfred E. Lawrence. Over a long period of time, the higher interest rates could reduce the amount of money available for road construction.

Part of last winter's $25-million bond issue for Detroit expressways is still held by the bond underwriters.

(*B&F continued p. 144*)

Money Costs More

Higher interest may slow new construction financing

The uptrend in the cost of money threatens to crimp effective demand for new construction during the second half of 1959. And if the rise in borrowing costs continues, it could stall the expansion of construction volume, now in its sixteenth consecutive month.

The latest spurt in borrowing costs shows up most dramatically in recent bids for U.S. Treasury short-term borrowings (bills) issued to investors July 15. The Treasury says it will have to pay an average interest rate of 3.728% on these borrowings—highest rate since 1921. In that year, the bill rate went to 5%.

It will take a few days to appraise the impact of these higher short-term lending rates on the long-term rates paid by construction borrowers.

However, states, local governments, industry and home buyers will surely have to pay investors more for construction loans. And higher borrowing costs will probably force some of these potential buyers out of the market.

Several states and many municipalities have faced serious fiscal problems this year. To keep their construction plans going, they'll have to borrow a good part of the funds. But the combination of rising interest rates and fiscal problems may force many public agencies to curtail their construction programs.

Interest costs ranging from 4% to 5% are discouraging some state and municipal governments from borrowing money needed for new construction. Last week, for example, Jefferson Parish, La., rejected bids for the second time on $10 million worth of its school bonds. The first bid would have cost 4.813%; the second, 4.724%.

Private Proposed Work Races to a New Record

ENR's Backlog of Proposed Construction by private interests moved to a new high at the end of June. It hit $49.8 billion, a $2-billion jump in only a year.

The June surge comes from commercial buildings and unclassified private projects. Each was up $100 million above the May total. A $72-million gas transmission pipeline for Florida and a $55-million line across five southern states lifted the "unclassified" total.

A net increase of $5 million in new waterworks projects marks the only public category to score an increase in June compared with May.

Record Highway Awards, But . . .

Although highway and bridge contract awards are at a record high for the first six months of this year, the uncertainty over financing threatens to pull 1959's total below 1958.

State highway departments planned a 10% increase over 1958 in 1959 awards. But contracts for the first half are only 1% above last year's record, according to ENR figures. The declines are primarily in state projects.

First-half awards are below 1958 in 20 states; only 11 states had planned to cut back this year.

Twelve states that planned to increase awards are behind 1958, with the year half gone. Four that planned to cut back are running ahead of last year.

Graver still are the figures reported by ENR for the beginning of the second half of 1959. The first two-weeks total for July is 16% below last month's pace—and 23% under the average for July 1958 (the record for July).

This drop in highway and bridge awards has pulled the 1959 total for 28 weeks 2.5% below the corresponding 1958 total.

. . . They're Well Behind State Plans

State and Region	TREND IN CONTRACTS LET in first half of 1959 State-County-Municipal Highway (Millions)	Bridge (Millions)	Total	Change '58-'59 %	TOTAL AWARDS PLANNED FOR 1959 States only Value (Mil.)	Change '58-'59 %
U.S. TOTAL	**$1,574.5**	**$303.6**	**$1,878.0**	**+ 1**	**$4,693.3(d)**	**+ 10**
Maine	6.5	1.5	8.0	− 14	32.4	− 9
New Hampshire	9.5	1.6	11.1	+ 12	32.4	+ 12
Vermont	14.8	1.0	15.8	+211	26.3	+ 40
Massachusetts	49.0	2.3	51.3	− 2	140.2	+ 9
Rhode Island	0.5	0.3	0.8	− 93	14.4	− 19
Connecticut	14.5	3.9	18.4	− 61	n.a.	---
NEW ENGLAND	**94.9**	**10.4**	**105.4**	**− 22**	**245.7**	**+ 7**
New York	133.9	25.5	159.4	+ 50	266.2	− 12
New Jersey	20.8	10.9	31.7	+ 0.4	111.6	+182
Pennsylvania	41.4	6.6	48.0	− 51	200.0	− 17
Maryland	22.5	6.7	29.3	− 2	63.5	+ 20
Dist. of Columbia	11.3	1.9	13.2	+ 87	63.6	+216
Delaware	1.2	4.1	5.3	− 12	16.0	+ 60
MIDDLE ATLANTIC	**231.1**	**55.8**	**286.9**	**+ 3**	**720.8**	**+ 8**
Virginia	15.5	5.1	20.6	− 29	114.0	+ 61
West Virginia	16.7	6.2	22.9	+ 98	67.0	+ 16
North Carolina	27.0	4.0	31.0	− 5	65.0	+ 3
South Carolina	27.8	7.8	35.6	+ 30	82.5	− 5
Georgia	41.3	8.4	49.8	+ 28	140.7	+ 44
Florida	48.6	4.1	52.7	+ 18	152.0	+ 38
Alabama	28.5	6.1	34.6	+ 66	88.0	+ 26
Mississippi	21.8	10.0	31.7	+ 92	61.8	+ 34
Louisiana	36.8	2.8	39.7	− 46	125.0	+ 2
Kentucky	52.6	0.4	53.0	+ 81	105.0	− 5
Tennessee	15.1	1.8	16.8	− 41	124.8	+ 33
SOUTH	**331.8**	**56.7**	**388.4**	**+ 10**	**1,125.8**	**+ 21**
Ohio	37.3	2.6	39.9	− 75	208.0	− 26
Indiana	21.1	11.6	32.7	+ 15	116.7	+ 13
Illinois	75.8	38.1	113.8	+ 18	260.0	+ 8
Wisconsin	34.7	9.7	44.4	+ 19	100.0	+ 5
Michigan	70.3	8.0	78.2	− 7	224.0	+ 34
MIDDLE WEST	**239.1**	**70.0**	**309.1**	**− 24**	**908.7**	**+ 3**
Minnesota	36.1	7.3	43.4	+ 21	122.0	+ 24
Iowa	56.0	13.2	69.3	+ 65	119.0	+ 7
Missouri	32.9	14.6	47.6	+ 3	96.0	− 3
Arkansas	11.0	5.9	16.9	− 5	n.a.	---
North Dakota	28.5	2.1	30.6	+ 52	49.2	+ 22
South Dakota	24.2	2.8	27.0	+101	54.5	+ 42
Nebraska	11.5	4.2	15.6	+ 13	46.0	+ 13
Kansas	24.8	7.0	31.8	− 19	80.0	+ 2
Oklahoma	12.4	5.6	17.9	− 50	45.0	− 51
Texas	182.0	8.4	190.4	+ 48	300.0	+ 2
Montana	8.5	0.3	8.7	− 33	76.4	+112
Wyoming	7.2	2.9	10.1	+ 25	40.8	+ 15
Colorado	22.1	2.8	24.8	+ 35	40.4	− 24
New Mexico	17.5	0	17.5	+ 61	40.0	+ 2
MISSISSIPPI TO ROCKIES	**474.5**	**77.1**	**551.6**	**+ 25**	**1,109.4**	**+ 5**
Idaho	11.9	0	11.9	+ 35	30.0	+ 3
Utah	11.4	0.9	12.2	+ 9	45.0	+ 41
Arizona	22.0	0.4	22.3	+ 32	40.0	+ 22
Nevada	5.0	0	5.0	− 44	32.0	+ 75
Washington	21.6	14.7	36.3	− 9	78.5	+ 17
Oregon	16.8	4.5	21.3	− 39	57.4	− 5
California	114.6	13.2	127.7	+ 6	300.0	+ 20
FAR WEST	**203.1**	**33.6**	**236.7**	**− 2**	**582.9**	**+ 19**

Something missing on this contractor's spread?

one more machine could save . . . not cost!

You see here a typical big earth-moving operation. The contractor has logically brought in a fleet of high-capacity scrapers to move big yardages at low cost. He'll make a good profit on this job.

Yet there's something missing in his busy machinery picture — one more machine that could make *extra* money for the contractor — advance his completion date — guarantee that his big scrapers will work only on high profit yardage — free him from concern over high cost of "odds-and-ends" earthmoving.

Makes profit on all size jobs

The missing machine is the 9-yd. LeTourneau-Westinghouse D Tournapull®. This smallest member of the Tournapull family "pulls its weight" on big spreads, as well as on small yardage contracts.

The "D" won't move big yardages as cheaply as 18- to 28-yd. scrapers shown. But it will profitably move those odds-and-ends that are left over when the big cuts are made. With the "D", this scattered yardage can be moved most economically, as fast as it develops.

Profit-maker on all job sections

Here's an earthmover that's useful on all sections of the job — in pioneering and finish-up stages as well as during the production period. With 29.5 mph speed, D 'Pull* can prepare a planned spread well in advance of production rigs. "D" grades temporary haul and access roads, opens cuts for big scrapers, prepares preliminary drainage.

In the final stage, "D" can rough-finish — using lowered bowl blade, or optional dozer blade — giving time-saving help to graders and dozers. This 9-yd. scraper economically handles access roads, shouldering, backfills, landscaping, and other work necessary for job completion, but which is not suitable for big-yardage scrapers.

Compare with present methods

The present equipment you are using for this work — crawler-and-pan combinations, old rubber-tired scrapers, long off the depreciation list — may do a satisfactory job. But it will pay you to compare their net operating costs per pay-yard moved with those of the speedy and economical D Tournapull. You may find the savings in "D" operation will put you money ahead. Get all the facts on this D Handyman.

*Trademark DP-1735-DC-L

Viewed from below, D Tournapull shows the smooth, yet rugged construction features that make it a dependable worker on any spread. Note absence of exposed pipelines, cables, lube points, and reach rods. Heavy-gauge steel encloses and shields all moving parts. "D" works safely in water, mud, sand or rock without damage to vital work components.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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Where quality is a habit

Building Act Moves

House vote brings federal buildings closer to start

The Public Buildings Act of 1959 has passed the House of Representatives without a single "no" vote; the Senate is expected to approve it before the end of the session.

The act replaces the lease-purchase system and gives Congress a tighter rein over federal construction.

Now being held up for lack of authority are 20 federal buildings for which sites have been acquired and plans completed. These projects—estimated at $520 million—will get the go-ahead signal from Congress once the bill is signed into law.

Under the bill, the government agency doing the building must first go to General Services Administration, which in turn seeks approval from the public works committees.

The bill contains three other provisions of interest to construction men:

- Public works committees need not be consulted for new buildings costing less than $100,000 or repairs and modernization costing less than $200,000. GSA can authorize those on its own.
- To prevent a backlog of projects from building up, no new authorizations will be made when there are 30 buildings that have been approved but for which funds have not yet been appropriated.
- If costs go up more than 10% between authorization and construction, GSA must come back to the public works committees for renewed approval.

The bill will bring about the first major change in procedure since 1926, except for the short-lived lease-purchase method of financing, which expired in July, 1957.

It will centralize authority for construction of federal buildings in GSA and the public works committees of both houses.

Philippines to Purchase $18 Million of Equipment

The Philippines will spend almost $18.8 million in the next 30 months for construction equipment and materials. The breakdown: $6 million for highway equipment, $3 million for materials and $9 million to $12 million for spare parts.

International Road Federation office, 1023 Washington Building, Washington 5, D. C., is headquarters for the Philippine buyer M. D. Bautista, Undersecretary of Public Works.

Industrial Building Contracts by Industry—First Half '59

INDUSTRY	Dollar Value 1959 (millions)	Dollar Value 1958 (millions)	% Chg.	Number of Plants 1959	Number of Plants 1958	% Chg.
All Industry	$1,357.0	$987.0	+ 37	1,059	756	+ 40
ABOVE 1958 DOLLAR VOLUME						
Chemical process*	458.7	410.6	+ 18	199	166	+ 20
Public utilities	327.6	220.2	+ 49	44	37	+ 19
Metal refining and rolling	176.5	108.9	+ 62	37	12	+208
Food	92.0	50.9	+ 81	185	124	+ 49
General	88.3	87.3	+ 1	269	218	+ 23
Machinery and parts	87.0	59.7	+ 46	140	103	+ 36
Aircraft	29.6	11.0	+168	46	18	+156
Automotive service	22.1	10.7	+107	51	32	+ 59
Radio, TV, electronics	15.2	9.8	+ 55	25	10	+150
Automobile	14.4	9.6	+ 51	10	5	+100
Textile	8.0	3.0	+168	21	10	+210
Wood	6.1	3.5	+ 73	18	11	+ 45
Foundries	2.2	0.3	+645	7	2	+250
Railroad	1.8	1.0	+ 85	5	4	+ 25
Refrigeration & cold storage	0.7	0.8	+ 15	4	4	0

* Includes aluminum production facilities

ENR data

Industrial Contracts Up 40%

Contracts for 1,059 new industrial plants were awarded in the first half of 1959—a 40% jump over the first half of 1958.

Chemical plants accounted for 20% of the contract awards and the score was almost as high for food plants. Not too far behind were new plant contracts for the machinery industry.

In dollar volume, American industry contracted for almost $1.4 billion in new plants in the first half of this year, up 37% over a year ago. This upturn reflects optimism shown earlier this year in business' spending plans for new plant and equipment.

The increased pace is also apparent in ENR's data on proposed industrial building plans, which shot up 143% above first half of 1958 to $1.7 billion.

Senate Passes TVA Bond Bill

As expected, the Senate last week approved a bill permitting the Tennessee Valley Authority to issue its own revenue bonds for financing expansion of power facilities. But the measure may bump into a Presidential veto.

President Eisenhower wants the Bureau of the Budget to control issuance and sale of the bonds. That's not in the Senate bill. And he doesn't want geographic expansion of TVA's area. The Senate bill permits expansion up to five miles beyond the present TVA service boundaries. The House version prohibits expansion without Congressional approval (ENR July 9, p. 26).

Both allow TVA to issue bonds up to a maximum of $750 million outstanding at any one time. Both give Congress power to review TVA bond plans and grant Treasury control of interest rates and maturity dates.

The two bills now go to a joint House-Senate conference committee.

Business in Brief . . .

- **Housing for Tucson**—Chesin Construction Co. of Tucson, Ariz., will erect three housing subdivisions with a total estimated cost of $40 million.
- **For going in to town**—Missouri's State Highway Commission is considering a 912-mile, $21-million farm-to-market road program.
- **Paper-producing plant**—Hoffman Construction Co. of Portland, Ore., will build Kraft pulp and paper mill at Toledo, Ore., for Georgia-Pacific Corp., Portland. Total cost: $10 million to $15 million.
- **San Francisco culture**—The City and County of San Francisco will vote in November on $12.3 million in new bond issues. Included is $7.6 million for a civic auditorium, $2.9 million for a park at Embarcadero and $1.8 million to improve the Palace of Fine Arts.
- **National Gypsum expands**—National Gypsum Co. will buy Murray Tile Co., Cloverport, Ky., a building tile manufacturer. Murray makes non-ceramic (quarry) tile used extensively in commercial and industrial buildings.

Finishes 11-terrace project in 2 days' time with fast-working "660" grader

When conservation-conscious farmers around Nelson, Neb., decide that their land needs some "fixing up", they often call on George Griffith for help. Griffith owns and operates a 160-hp LeTourneau-Westinghouse* Model 660 grader with which he builds effective terrace systems and does other conservation-type work in short order.

On the Delbert Johnson farm, for instance, Griffith quickly completed 11 terraces, totaling 10,270' in length. The "660" made short work of the heavy clay material found there, completing the entire job in 2 working days.

"Hangs onto slopes"

"This grader has lots of capacity for heavy work," says Mr. Griffith. "It has good weight distribution and hangs onto slopes well. That's important in terrace work. I like the high-arched front axle, too, because it makes it possible for the machine to straddle a bigger pile of dirt. The control system is very good."

Versatile LW grader is right at home on conservation jobs, where work sites are widely scattered and projects vary in both size and requirements. LW graders . . . from the 80-hp "330" to the 190-hp POWER-*Flow*® 660 . . . road job-to-job at speeds to 26 mph. They're easy to operate, can be quickly shifted from one speed range to another for matching push to load. They've got the power-weight combination to move heavy blade loads, and the accuracy to do the job right on the first pass.

Demonstration at your convenience

If you'd like proof of this grader's superior performance in land improvement work, ask your LW Distributor for a demonstration. You name the time and the place . . . no obligation to you, of course!

*Formerly known as the Adams grader

Building 11 terrace sections, each 10,000' to 11,000' in length, LW Model 660 grader took just 2 days time. Owner George Griffith of Nelson, Neb., handles many irrigation projects for local farmers who are working in cooperation with the government's soil conservation service.

G-2093-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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Crippling Strikes Hit Industry

- **High labor demands and strong contractor resistance stall construction in Arizona, Alaska and New York City. Work on Glen Canyon Dam stops.**
- **Despite the resistance, settlements are proving just as expensive as ever. Wages and fringe benefits remain the central issues.**

Thousands of construction workers in various parts of the country were idle last week as a result of stalemates in collective bargaining.

The amount of construction stalled ran into millions of dollars. Payroll losses were heavy and local economies were feeling the pinch of incomes reduced to unemployment compensation levels to nothing.

The general picture was an obvious reflection of firmer contractor resistance to high pay increase demands of building trades unions. But aside from that, it contained few, if any, positive or far-reaching elements, such as the steel industry's insistence on a wage freeze and the elimination of costly union-imposed work practices. At the same time it indicated a disturbing breakdown in the bargaining process, as negotiators in some cases refused to meet or even to schedule talks.

In fact, settlements that have been reached recently emphasize this negative approach to bargaining and indicate, from the contractors' point of view, that the result of a strike adds up to little but the difference between a retreat and a rout.

Wage increases of 15 and 20 cents an hour, for example, are not uncommon in the new settlements. Only one wage freeze—Chicago glaziers—was reported. The "Ten Commandments" received no fanfare. No significant developments or innovations were reported in fringes, in hiring practices, or in bargaining methods.

Last week's biggest stoppage was in Arizona, where all construction was shut down through the state in a series of labor disputes that has been snowballing for over a month.

The state's sand, gravel, cement and asphalt plants were at a standstill in a wage dispute with laborers, operating engineers and teamsters, who seek wage increases ranging from 43 to 89½ cents an hour.

Sheet metal workers were out in nine counties. They are asking for an increase in welfare contributions and retention of a foreman clause as well as for a 42-cent pay boost in a two-year contract.

A dispute with Merritt-Chapman & Scott over subsistence pay pulled 750 workers off the Bureau of Reclamation's huge Glen Canyon Dam project.

And Arizona operating engineers, who pulled away from joint bargaining with contractors in Phoenix, continued a strike that began on June 3. The engineers were seeking not only pay increases of 86 to 92 cents an hour in a two-year contract, but higher subsistence pay and 3½% welfare and pension plans.

Net result of all these Arizona strikes is that 29,100 workers were idled, pushing the weekly payroll loss to $3.5 million. The governor failed in his efforts to mediate the engineers' dispute and reported "no further meetings scheduled." Retail trades are feeling the pinch. Sales and gas taxes are down. There are rumblings of an "open shop" for Arizona.

Meanwhile, a strike of 1,200 teamsters against 50 New York City and Long Island sand, gravel, cement and asphalt companies began shutting down construction jobs in those areas. An industry spokesman estimated that over $200 million worth of work had been halted and over 40,000 construction workers were laid off.

Fruitless negotiations have been in process for several months. State and city mediators have had little luck in getting the negotiating teams together. A spokesman for the struck contractors called union demands "unprincipled" and "inflationary." He estimated they would cost $1.44 an hour in a two-year contract. Union members, who now get $125 for a 40-hour week, have rejected a two-year, 30-cent package accepted earlier by the excavator and mason-material teamsters.

The end is in sight for two major strikes by carpenters in Alaska and Colorado. Alaska carpenters reportedly reached an agreement with the AGC, but it must be ratified.

Striking carpenters in Denver and northern Colorado are expected to ratify a two-year pact, with a 31-cent hourly increase. Pickets are already removed.

Meanwhile, strikes continue to hit:

- Millions of dollars worth of construction work was stalled in Ohio's Portage, Summit and Medina counties by a strike of building material drivers.
- Laborers were out in Wabash, Ind.
- The Cleveland area was hit by an iron workers strike and a strike by plumbers began to tie up construction work in Dallas. Contractor offers rejected by some of the unions included annual increases of 10 cents an hour and a three-year, 38-cent package.

Elsewhere, strike settlements were resulting in substantial increases:

Painters in the San Francisco area won 70 cents over a three-year period after a two-day strike; Albany, N. Y., bricklayers, who struck for eight days, were granted 32½ cents in a two-year contract; a month-long strike in Cincinnati ended in a two-year, 28-cent contract for sheet metal workers and a two-year, 25-cent pact for plumbers; Scranton, Pa., plumbers and steamfitters called off a 22-day strike with a new one-year contract boosting home-building rates by five cents and commercial rates by 15 cents.

How do these compare to strike-free settlements? Here are some examples:

Plumbers and steamfitters in Milwaukee have accepted a one-year, 17-cent package that may set the pattern for the other trades. They get seven cents in pay and 10 cents for a united construction industry pension fund, which is expected to become general in the area for the first time.

In San Diego County, Calif., five of six basic trades have settled for three-year contracts that grant wage increases ranging from 25 to 67 cents over the contract period.

(*Labor continued p. 151*)

"These units are built rugged . . . and that's the kind of equipment we need on this job"

Move 1.2 million yd of earth and rock building 5 mi of Trans-Canada Highway

Tom Shea, Superintendent for John Laing and Son (Canada) Limited

John Laing and Son (Canada) Limited, Vancouver, B.C., Canada took on "a tough one" when it contracted to build the 5 miles of Trans-Canada Highway east of Revelstoke, B.C. Material to be moved totaled over 1,250,000 yd . . . most of it rock-soil. The road was being cut high on mountain sides and haul roads were rough. The weather was usually wet.

To handle the "scraper dirt" on this primarily shovel-and-truck project, Laing brought in 3 new LeTourneau-Westinghouse B Tournapulls® with 28-yd Fullpak® scrapers. How did these LW machines perform? The photographs and captions tell the story!

Check into how and why the LeTourneau-Westinghouse 28-yard "Big B" can speed production on *your* jobs. Ask for complete facts and a demonstration.

B Fullpak is push-loaded in an average of 75'. When loading, scraper's bowl floor is angled at only 1° . . . lets dirt flow in almost horizontally. And with Fullpak scrapers it has only a short boiling lift to heap a big-capacity load. Thus most of "B's" power can be used for cutting, less is wasted lifting. 28-yd "Big B" packs in big payloads *fast!*

John Laing's B Tournapull dumps its load fast thru big 7'1"-high, 10'-wide opening. Positive-ejection tailgate cleans out even the stickiest muck in a single pass. With the "B" there's no "carry back" to steal pay-yards from the next load.

High up on narrow shelf-like road, pivot-steer B 'Pull' makes fast continuous U-turn in area less than its own length. Quick turn-arounds like this reduced cycle time . . . permitted the Canadian contractor's "B's" to complete more trips per hour.

John Laing and Son originally purchased 3 C Tournapulls with 22-ton Rear-Dumps for their shovel haul-fleet. Pleased with the way they performed, Laing added the B Tournapull scraper units. Here, their LW Rear-Dumps are shown working at a $100-million thermal-generator project at Ioco, British Columbia.

*Trademark BP-2065-DCJ-1

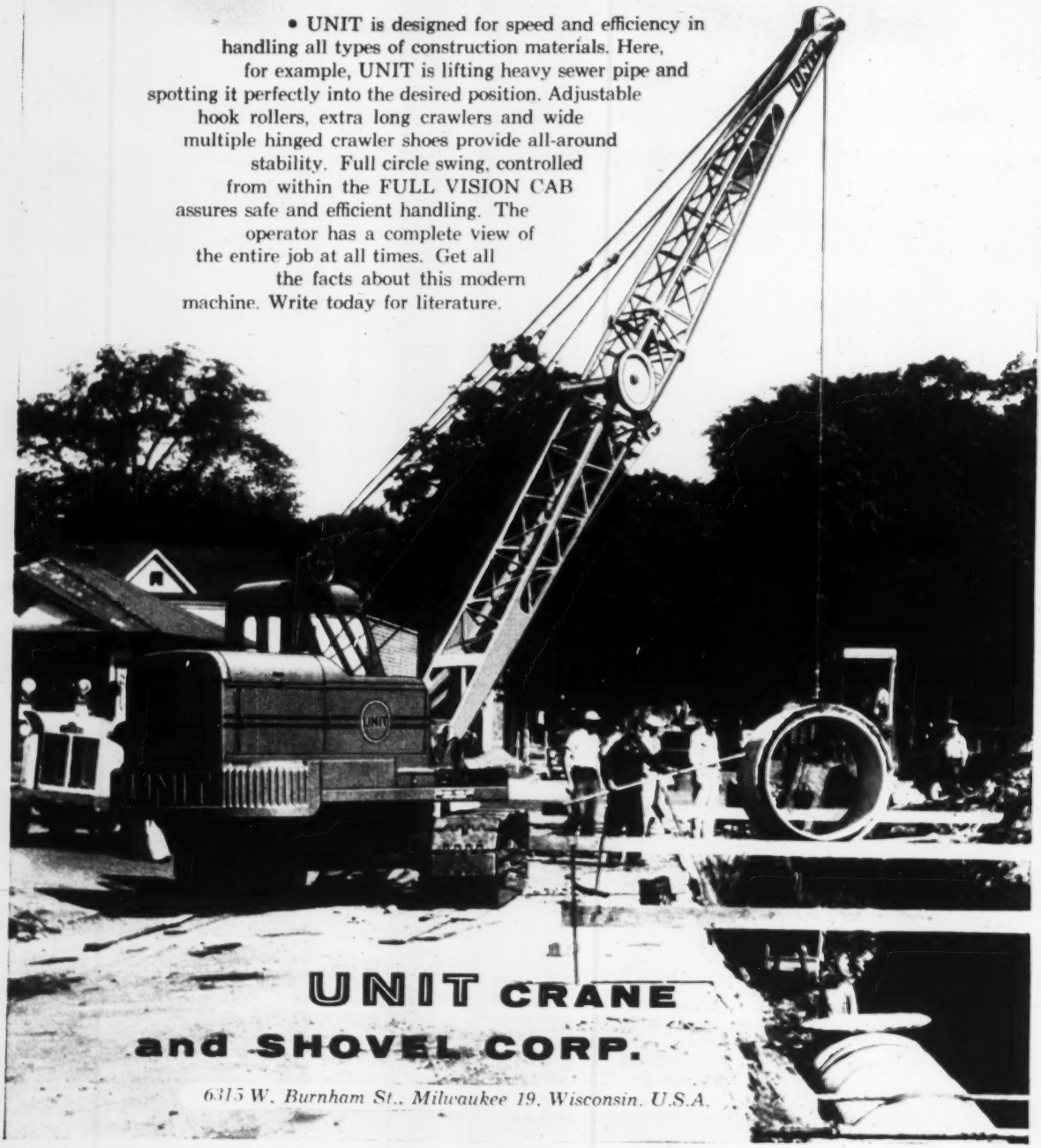
LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

fast Handling with SAFETY!

• UNIT is designed for speed and efficiency in handling all types of construction materials. Here, for example, UNIT is lifting heavy sewer pipe and spotting it perfectly into the desired position. Adjustable hook rollers, extra long crawlers and wide multiple hinged crawler shoes provide all-around stability. Full circle swing, controlled from within the FULL VISION CAB assures safe and efficient handling. The operator has a complete view of the entire job at all times. Get all the facts about this modern machine. Write today for literature.



UNIT CRANE and SHOVEL CORP.

6315 W. Burnham St., Milwaukee 19, Wisconsin, U.S.A.

Hiring Restrictions: Can't Escape Them

Employers and unions cannot escape the legal restrictions on hiring practices by leaving them out of their contracts.

A "tacit arrangement and understanding" can constitute "an unlawful exclusive hiring hall" as defined in the Mountain-Pacific case, says the National Labor Relations Board. And the Brown-Olds reimbursement remedy will be applied to such violations.

A local of the operating engineers union has just found this out the hard way as the result of a situation that developed on an Arkansas project of Armco Drainage and Metal Products, Inc. A Houston worker, who came to work on the Arkansas project, was constructively discharged because the local union refused him a work permit.

Despite the absence of a written contract, the board found that "it was Armco's practice to seek union clearance for its employees on all projects." It was convinced by the evidence that this practice was required by the union. Result was an illegal "bilateral" arrangement.

The union was required under the Brown-Olds rule to refund all union dues and fees unlawfully collected from present and former employees of Armco at the Arkansas project. (Armco was not named in the complaint or penalized.)

The fatal defect in the hiring arrangement was that it violated the principle that no worker can be denied a job simply because he is nonunion or not a member of the appropriate union. It is this principle—written into Taft-Hartley the Mountain-Pacific and Brown-Olds rules seek to protect.

Two members of the board in the Armco case voted against the Brown-Olds assessment. They said the illegal incident was "isolated" and that the evidence was "insufficient to establish the existence of any continuing practice or contractual arrangement."

NLRB Turns Down Lockout Complaint

The general counsel of the National Labor Relations Board has dismissed for lack of evidence union efforts to prosecute Cleveland contractors who engaged in a long lockout early last summer.

Effect of the ruling is to reaffirm the right of a contractor group engaged in joint bargaining to resort to a lockout when one of the unions breaks away from the group and strikes.

In the Cleveland situation, the Building Trades Employers Association has traditionally engaged in joint bargaining for the industry with the Building and Construction Trades Council. After negotiations began last year, the asbestos workers union walked out of the negotiations and struck. Member groups of the BTEA shut down their jobs, creating a lockout of the other, but non-striking, union involved in the negotiations.

Two of the unions—plumbers and sheet metal workers—claimed this was an unfair labor practice and that the lockout was illegal. They filed charges against the BTEA, the Sheet Metal Employers Association and the Mechanical Contractors Association.

The regional director of the NLRB refused to issue a complaint. He relied on the Buffalo Linen case, which supports the right of employers to bargain collectively and to take concerted action, such as a lockout.

Although the number of workers involved in the asbestos workers strike was small—only 200—the principle was a critical one. If the BTEA had entered into separate negotiations with the union, for example, it would have destroyed the joint bargaining arrangement and given the unions a chance to engage in whip-saw tactics.

Labor board officials, in turning down the union charge, implied that the right to engage in a lockout is an integral part of joint bargaining rules. They said permitting the break-up of joint bargaining would destroy the stability the construction industry in Cleveland has enjoyed for many years and would not promote the general policies of the law.

Court Upholds Agency Shop Clause

Labor's interest in what is known as the agency shop clause as one way out of the right-to-work corner may increase as the result of a recent Indiana appeals court decision.

The court ruled that a labor union in a right-to-work-law state may demand that an employer bargain on the inclusion of an agency shop clause in a labor contract unless the state law expressly forbids the union to require monetary contributions from the nonunion workers it represents.

Under an agency shop clause, a union compels nonunion members in the bargaining group it represents to pay their share of the cost of union representation. Union membership is not required.

The new ruling affirms a lower court refusal to enjoin a local of the electrical workers union from trying to negotiate an agency shop clause.

The question raised is whether compulsory contributions for union representation are banned by a law that merely outlaws compulsory union membership. As the Indiana law now stands, the answer is "no."

"This payment of the fair share of representation is completely distinct and substantially different from compulsory membership in a union," the lower court said.

In the Indiana case, the union wanted to collect from nonunion members an amount of money "equal to that paid by other employees in the bargaining unit who are members of the union." The amount could not exceed the union's regular dues and initiation fees and its uniform assessments.

The court reasoned that a union must represent nonunion members in a bargaining unit. These nonunion members receive the benefits of union representation and should pay their fair share of the cost of the representation. It adds up to nothing more than "a payment for benefits received," the court said, and avoids the possible compromise of "principles" that compulsory union membership may entail.

Three other states—Arizona, Nevada and North Dakota—permit the agency shop. All the rest of the 19 right-to-work states do not.

The Indiana decision may prove useful to those who are fighting the right-to-work battle on the legislative front.

Labor in Brief . . .

• **Minimum wage**—The AFL-CIO says the Kennedy-Morse-Roosevelt bill to raise the minimum wage to $1.25 and to extend the law to an additional 7½ million non-farm workers would reach one million more workers in construction companies doing $50,000 or more business a year.

• **Another tack**—Attorney Godfrey Schmidt, a former teamster union monitor, said last week he will start new litigation to unseat union president James Hoffa. Mr. Schmidt, who remains attorney for a group of dissident union members, recently resigned as a monitor after a federal appeals court called attention to a conflict of interest.

• **Challenging the AFL-CIO**—In defiance of an AFL-CIO no-raiding ban, James Carey's electrical workers (old CIO) union has wrested representation rights at a Long Island plant from the sheet metal workers (old AFL) union. This promises to revive the long-standing feud between the federation's Industrial, Metal and Building Trades departments over jurisdiction and organization.

• **Where will they come from?**—The U. S. Labor Department, which estimates an increase of 10 million in the nation's labor force by 1965, expects the number of construction workers to increase both numerically and as a percentage of the total labor force. Only a few of the new 10 million will come from the 25-44 age group and half the total increase will be women.

• **Steel may be the pattern**—The steelworkers union opened its bargaining negotiations with Aluminum Co. of America, Reynolds Metals Co. and Kaiser Aluminum and Chemical Corp. last week. Observers expect nothing to be accomplished until a settlement is reached in the steel industry. The union has indicated its demands will follow those presented in the steel talks.

• **Laborers settle**—A 24-day strike, affecting $7 million worth of construction in Huntington, W. Va., has ended. About 800 members of the hod carriers, builders and common laborers union signed a new two-year contract. It calls for 7½ cents in welfare benefits, retroactive to June 15, plus an undisclosed wage increase.

Strike Loss High in '58

Strikes last year cost the construction industry more man-days of work than in any other industry.

The U. S. Labor Department's Bureau of Labor Statistics reports that the industry suffered 844 work stoppages. These involved 326,000 workers and caused 4.7 million man-days of idleness. Only twice in the past—1952 and 1953—has the loss been greater.

About two-fifths of the idleness is attributed to five stoppages involving 100,000 workers.

These included a 37-day strike in Oregon and southwest Washington in July and August, a 48-day stoppage in the Cleveland area in May and June, a 50-day strike in the Houston and Galveston area in the fall and a 54-day stoppage in New York State during the summer.

(The Cleveland stoppage led to the adoption of a modified version of the industry's 10-point work practices code known as the "Ten Commandments". The New York strike, which involved upstate iron workers, led to a realignment of employer associations to put them in a stronger bargaining position.)

In contrast to the strike picture in the construction industry, the total man-days of idleness in all nonagricultural establishments was relatively low compared to postwar levels, the bureau says.

The bureau recorded 3,694 stoppages involving 2 million workers and 23.9 million man-days of idleness. (The figures include strikes and lockouts involving six or more workers and lasting at least a full day or shift.) Amount of time lost was substantially higher than in 1957, but the bureau attributes this to an increase in the size rather than the number of strikes.

Among the major 1958 strikes in allied industries was one at Caterpillar Tractor Co., one at International Harvester Co. and one at Pittsburgh Plate Glass Co.

Bulk of 1958 work stoppages resulted from disputes over wages, hours and working conditions during contract negotiations.

Guilty of Boycott

Union liability tied to disciplinary threats

A secondary boycott charge may be pinned on a building trades union if the union threatens to enforce against its members a constitutional or bylaw provision that forbids members to work on nonunion material.

In a case against the United Brotherhood of Carpenters and three of its Illinois locals, the National Labor Relations Board has ruled that the threat of union disciplinary action was a lever to force their members to strike in order to compel their employer to quit doing business with a nonunion manufacturer. Result was a typical secondary boycott banned by the Taft-Hartley Act.

Employer in the case was Midwest Homes, Inc., which was using windows produced by a nonunion company, Andersen Corp., in its semi-prefabricated homes.

The union objected to the Andersen windows and was accused of three types of activity aimed at halting the use of them: Removing the union label from Midwest homes; refusing to issue work permits for Midwest employees; and threatening to discipline members who violated the union's constitutional ban against handling nonunion materials.

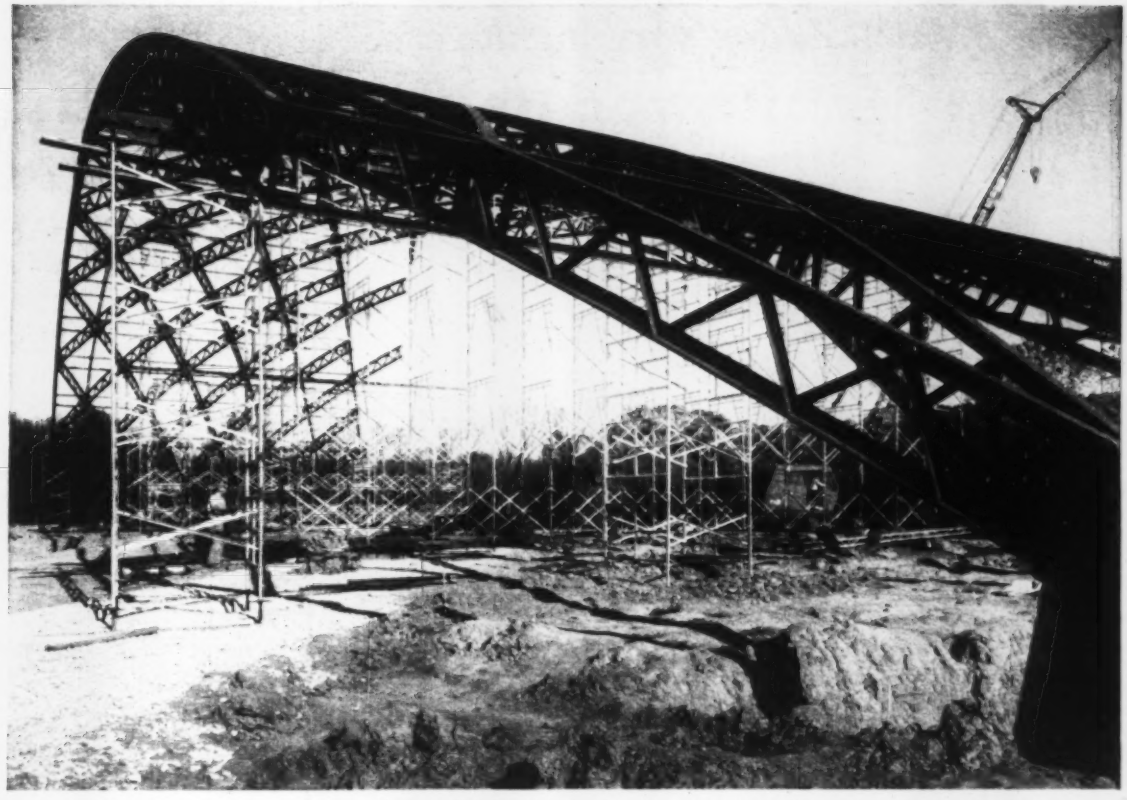
The board said that by alluding to the punitive provisions of the respondent's constitution and bylaws, Welsh (the international representative) was applying these provisions to induce and encourage members to refuse to handle Andersen's nonunion products within the meaning of Section 8(b) (4)(a) of the Act" (the secondary boycott section).

In a sweeping order, the board directed the unions to cease and desist from each of these activities and from any other conduct that encourages union members to strike to force any employer to quit handling the products of any company that does not use the carpenters' union label.

Alaska Compensation Law Applies to Federal Jobs

Construction workers on federal projects in Alaska are now covered by the Alaska Workmen's Compensation Act. The Defense Base Act and the War Hazards Compensation Act no longer apply.

The law gives the State Industrial Board full jurisdiction over workmen's compensation cases and extends coverage of the State Compensation Act, retroactively to January 3, to all workers employed on federal projects.



STEEL LAMELLA roof construction of new Ladue H. S. Auditorium, St. Louis, being shored with "Trouble Saver" Steel Shoring. Cristina Constr. Co., gen. contr. Kroger Erection Co., steel erectors. One of three recent jobs, see below.

New Shoring Method Cuts Steel Erection Time 20%

THE USE of prefabricated PS Co. Steel Shoring components as temporary cribbing for the support of steel beams and girders on three recent steel erection jobs is now showing that erectors can save up to 20% of the time needed on job completion dates over former methods. Steel shoring offers the same money-saving advantages to steel erectors as it does to concrete contractors.

Considerable materials and equipment savings are being evidenced. The pre-fab steel shoring components are more easily and quickly handled and assembled, are completely reusable, and can be *rented* for the particular job. Mobile cranes and other heavy equipment can be kept down to a minimum, as well.

Three types of equipment are available for shoring of steel:

1—Standard components of prefabricated "Trouble Saver"® Sectional Steel Shoring, consisting of 3' to 6'6"-high end frames, diagonal braces for a variety of frame spacings, fast-acting Slide-Loks, bases, U-heads and adjustable screw legs.

2—Extra Heavy Duty Shoring, consisting of 3½" dia. legs which can be spaced in multiples of 6'4" or 8' in both directions, braces and girts. Sections are 6'6" high.

3—"TubeLox"® Steel Shoring, consisting of interlocking 2" or 2½" O.D. tubular steel members in 6' to 20' lengths, right angle couplers, adjustable couplers, diagonal braces, bases and "TubeLox" wrench.

Modern shoring equipment speeds steel erection on these three typical construction jobs:

Ladue H. S. Auditorium, see photograph above.

New Hangar No. 17, Idlewild Airport, N. Y., with 158'-long steel box girders shored with 16 towers, each side, made of Extra Heavy Duty Steel Shoring components. White Plains Iron Works, Inc., steel erectors.

Steelwork for the new overpass over downtown St. Louis shored with "TubeLox" Steel Shoring. St. Louis Steel Erection Co., contractors.

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Long Island City 1, New York

Branches in all principal Cities

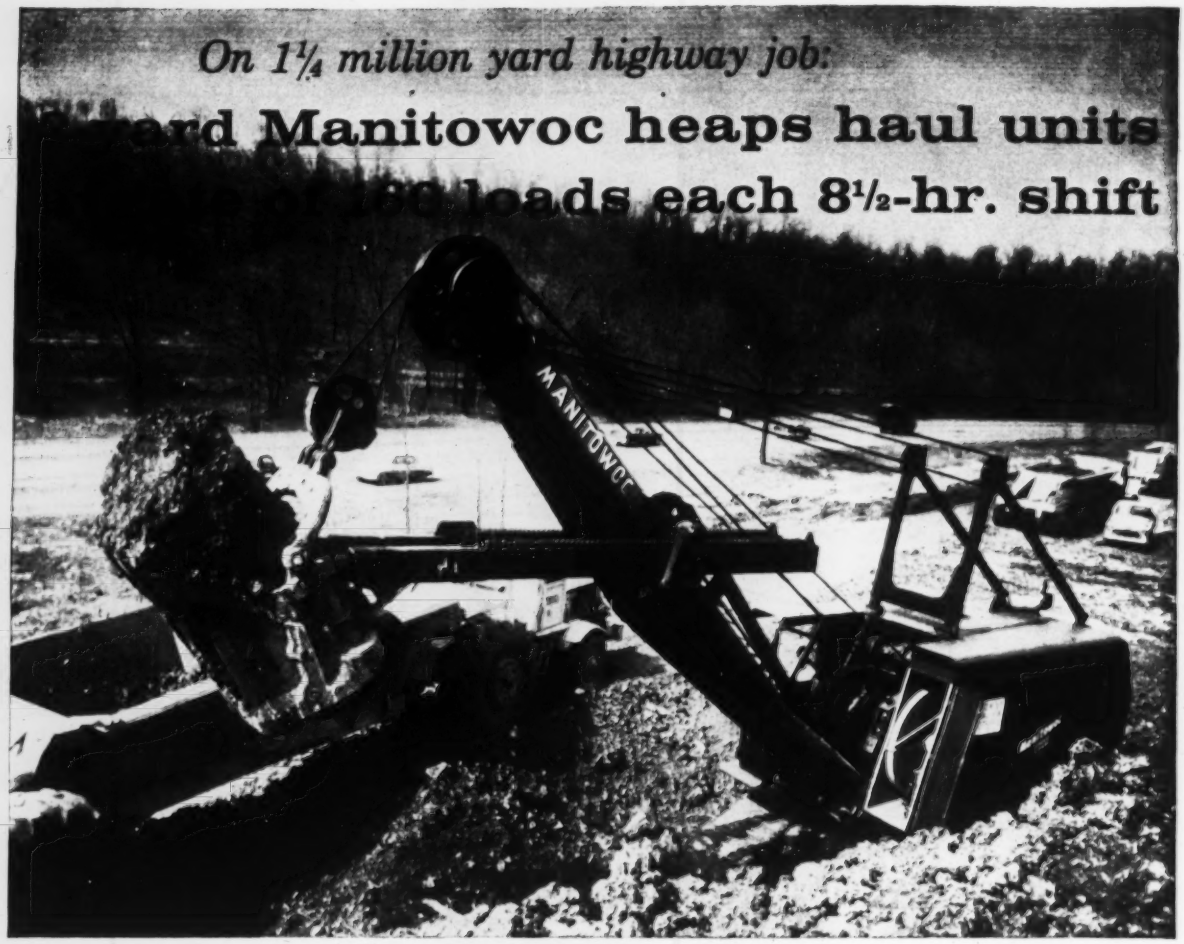
SHORING METHODS FOR STEEL AND CONCRETE CONSTRUCTION

Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

SALES RENTALS

On 1¼ million yard highway job:

...rd Manitowoc heaps haul units ... loads each 8½-hr. shift



An important segment of the Interstate Highway program is now under construction 20 miles Southwest of St. Louis. Here Fred Weber Contractor, Inc. of St. Louis has the contract for approximately nine miles of new Interstate 44.

One section of the 1¼ million yard job is shown here — a 35,000 yard cut paralleling U. S. Route 66. Weber is using a 3-yd. Manitowoc Model 3600 shovel on this cut. An average of 160 heaped haul units are loaded each 8½ hour day. The hauling fleet, six 25-yd. and two 18-yd. units, has a long 12,000 ft. one-way haul, stopping traffic to high-ball across Route 66.

"Easy as pie" operation

On the same job Weber also has another 3-yd. Manitowoc shovel, a 25-ton Manitowoc Crane driving 50-ft. piles 45-ft. deep, and a 2½-yd. shovel working in a nearby quarry. When interviewed at the job site, Superintendent John R. Weber said, "We're getting very good production from the model 3600. It gives us more output with less maintenance." And the shovel operator, F. C. Warneke noted, "It's easy on the operator because air control makes it easy as pie."

Bonus Output Features

The Manitowoc 3600 gives you air controls, torque converter drive, disc-type clutches, and removable counterweight as *standard* features . . . provides equally great performance as a trench hoe, crane, dragline or clamshell. Analyze your upcoming bids now . . . see how the 3-yd. 3600 can help your profit picture. Your Manitowoc distributor will gladly fill you in on all the facts.

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
25 TON - 100 TON	1¼-YD. - 5½-YD.	1¼-YD. - 6-YD.	1¼-YD. - 3-YD.

Damages For Breach of Contract

New York court rules that liquidated damages must be reasonable, not punitive

A contractor is entitled to receive a reasonable approximation of the actual damages sustained when the owner breaches his contract. But if liquidated damages fixed in the contract are disproportionately large compared to actual losses, they will be considered punitive and disallowed.

If the actual losses can readily be determined, they will be awarded as damages. The injured party may receive the difference between the contract price and what it would have cost to perform the contract. But in estimating the cost to perform the contract, a contractor may not use the prices submitted by his subcontractors.

That is the ruling of a New York court in a case that arose when a contractor was hired to repair a building for $2,000. The contract provided that, if the owner breached the contract, the contractor was entitled to receive 30% of the contract price as liquidated damages or to sue for the actual damages sustained.

Before work began, the owner cancelled the contract. The contractor sued for $600—30% of the contract price.[1]

"The trial court dismissed the case on the grounds that the amount of liquidated damages fixed in the contract was disporportionate to actual damages sustained. It ruled that the 30% provision was in the nature of a penalty and could not be enforced."

Furthermore, decided the court, the actual loss of profits could readily be determined. Therefore, the court dismissed the suit without prejudice, enabling the contractor to start another action and prove the actual damages sustained.

The court stated: "The rule is that the amount (fixed) as liquidated damages must be reasonable and not disproportionate to the probable damages. It must be based on the principle of just compensation."

The court, quoting from an earlier judgment by the New York Court of Appeals, said: The rule adopted by the courts to determine damages for breach of contract is to secure for the injured party only such advantages as the parties must be deemed to have had in mind when making the contract.

This excludes all contingent and uncertain profits and everything that may not reasonably be supposed to have been within the contemplation of the contracting parties and would not naturally follow the breach.

"The injured party may recover, as damages, the difference between the contract price and what it would have cost to perform the contract."

But in determining what it would cost to perform the contract, said the appeals court, the contractor may not use prices he has received from subcontractors. The agents of the city[2], in agreeing to the contract prices, could only have had in mind the cost of work to the party by whom it should be performed, and the profits to which the contractor would have been entitled had he performed the work himself, rather than through subs.

According to the appeals court opinion: A party seeking damages for breach of contract is not entitled to the benefits of, or protection against, a contract made with third persons (subcontractors) but not contemplated at the time that the general contract was negotiated.

The advantages and benefits of subcontracts are too uncertain and contingent to be considered in estimating the profits a general contractor might have made under his contract.

The trial court concluded that "upon the same basis of reasoning, the contractor cannot saddle the owner with loss of profits based upon prices for labor and materials furnished by its subcontractor."

(1) Weatherproof Improvement Contracting Corp. v. Kramer, 172 N.Y.S. 2d 688, Municipal Court of the City of New York, Borough of Bronx, May 3, 1958.

(2) Devlin v. Mayor of the City of New York, 63 N.Y. 8, pp. 25-26.

These summaries of court decisions are prepared by I. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

OFFICIAL PROPOSALS

Bids: October, 1959.

Invitation YS-2-8, for Fixed Wheel Gates, Frames, Guides, Hoists, and Appurtenances

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand
INVITATION FOR BIDS—NO. YS-2-8

The Royal Irrigation Department of the Kingdom of Thailand hereby invites sealed written bids for furnishing and delivering the following goods, equipment, and materials either fob Contractor's Dam and Power Plant, Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents, Invitation for Bids—No. YS-2-8, for:

> Design, manufacture, and supervision of installation of (3) Fixed Wheel Gates for penstock intakes, each with hoist, controls and appurtenances, and (8) complete sets of gate frames and guides, all as required for field assembly and installation. The gates are each nominally 3.70 meters wide and 5.77 meters high, and will be operated under a maximum head of 60 meters.

Bids will be issued in July 1959 and will be opened in October 1959. Copies of Contract Documents, Invitation for Bids—No. YS-2-8 may be obtained by qualified Bidders on written request on Bidder's letterhead, addressed to:

> Royal Irrigation Department
> Attention: Thai Liaison Engineer
> c/o Engineering Consultants, Inc.
> 1940 West Mississippi Avenue
> Denver 23, Colorado

Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $10.00 for each copy of the Contract Documents requested. The remittance is nonreturnable.

M. L. Nujati Kambhu
Director General
Royal Irrigation Department
Kingdom of Thailand
Bangkok, Thailand

Bids: August 11, 1959

Contract NYA-410.002

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
PERMANENT DEWATERING WELLS

Sealed proposals for furnishing and installing a well system for the Central Terminal Area at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, August 11, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.
THE PORT OF NEW YORK AUTHORITY

S. Sloan Colt, Chairman

New York, July 16, 1959

OFFICIAL PROPOSALS

Bids: August 6, 1959.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Public Buildings Law, Canal Law and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 6th day of August 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. NICKERSON, District Engineer, 353 Broadway, Albany 1, New York						
Rensselaer (Rte. 151)	FARC 59-43	Barracks Road, S.H. 102 Proj. S-497(1)	1 92	Asphalt Conc. Pavt. = 1.91 Mi.; Misc. Work = 0.01 Mi. R.C. Arch Br. 24' Sp.	$30,000 Plans $5	$552,000
Rensselaer & Saratoga (Rte. 67)	FARC 59-110	Stillwater-Schaghticoke, S.H. 1791 Proj. F-631(4)	0 42	Asph. Conc. Pavt., Raise & Rehabilitate Exist. 6 Sp. Truss Bridge, Steel Truss Br. 1 Sp. 180'	$15,000 Plans $5	264,000
Saratoga (Int. Rte. 87)	C.R. 59-3	Interstate Route 502-2-2 Sect. 3 Clifton Park-Malta		Removal of Human Remains	$150 No Plans Proposal $2	2,600
DISTRICT No. 3, EARLE E. TOWLSON, Acting District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga (Rte. 80)	R.C. 59-131	Vesper-Tully, S.H. 1070; Skaneateles-Hamilton Pt. 1, S.H. 330; Vesper-So. Onondaga Pt. 1, S.H. 557; Syracuse-Otisco Pt. 2, S.H. 1649	12 16	Asphalt Conc. Ty. 1A Pavt.	$40,000 Plans $5	737,000
Oswego (Int. Tour Rte. 81)	FISH 59-1 FARC 59-1	Interstate Route 505 (Parish-Jefferson County Line, Pt. 1) Mapleview-Checkered House, S.H. 9284 Proj. I-81-2(18)110 and S-522(1)	9 48 (5 00 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide = 8.73 Mi.; 9" Cem. Conc. Pavt. (Ramps) = 2.22 Mi.; Asph. Conc. Pavt. = 2.02 Mi.; Top Crse. Graded Gravel = 1.51 Mi.; 8 Hy. Sep. Comp. W-F Beams 230.2', 135.4', 139.1', 312.1', 121', 119.4', 121.8' and 121.8'; 2 R.C. Twin Box Brs. 31' and 31'	$400,000 Plans $10	7,410,000
Wayne	R.C. 59-102	25 Various State Highways on Rtes. 14, 21, 31, 88, 89, 104, 104A, 350 and 414		Roadside Development	$350 No Plans Proposal $2	6,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	R.C.C. 59-117	City of Rochester: Inner Loop (Genesee River Bridge and Approaches) FACG 53-11	0 27	Sealing, Repairing and Painting Existing 15 Span Steel Stringer Bridge	$5,700 Plans $5	98,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus	FAC 59-12	City of Olean: East-West Arterial Highway (East State Street: Union St. to Barry St.). Proj. U-141(6)	0 14	Asphalt Concrete, Type 2A = 0.09 Mi. Misc. Work = 0.05 Mi.	$3,500 Plans $5	68,000
Erie (Int. Tour Rte. 190)	FINTC 59-3	Interstate Route 506, N. Y. State Thruway, Niagara Section, Subd. N4 and N5 (City of Buffalo: Franklin St. to Porter Ave.). Proj. I-190-1(18)74	1 64 (0 60 Acc.)	Electrical Lighting Facilities	$5,500 Plans $5	99,000
Erie (Int. Tour Rte. 190)	FINTC 59-4 NTC 59-5	Interstate Route 506, N. Y. State Thruway, Niagara Section, Subd. N1, N2, N3 and N7 Proj. I-190-1(19)72		Furnishing and Installing 28,700 L.F. Chain Link Fence	$5,000 Plans $5	90,000
Niagara (Rte. 18)	FARC 59-105	Youngstown-Olcott Pt. 2, S.H. 8324 Proj. F-461(7)	2 09	Asphalt Concrete Pavement	$9,000 Plans $5	171,000
DISTRICT No. 6, JAMES H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegany (Rte. 19)	T.C. 59-3	Belmont-Scio, S.H. 5476; Canaadea-Fillmore-Hume, S.H. 5518; Fillmore-Portageville, S.H. 9210	0 03	Furnishing and Installing Traffic Signal	$700 Plans $5	13,00
Schuyler (Rte. 414)	FARC 59-113	Post Creek-Watkins Glen Pts. 3 and 4, S.H. 8402 Proj. F-591(4)	6 50	Asphalt Concrete Pavt.	$40,000 Plans $5	712,000
DISTRICT No. 7, ROBERT W. SWEET, District Engineer, 144 Van Duzee Street, Watertown, N. Y.						
Franklin (Rte. 374)	FARC 59-109	Chateaugay-Canadian Line, S.H. 8040 Proj. S-81(2)	4 65	Bit. Double Surf. Treat. Pavt. = 4.54 Mi.; Asph. Conc. Ty. 1A Pavt = 0.11 Mi.; Widen Exist. Conc. Arch BR. 30' Span	$38,000 Plans $5	687,000
Franklin & St. Lawrence (Rte. 37)	FARC 59-100	Masena-Helena Pt. 1, S.H. 1261; Raquett River-Hogansburg Pt. 1, S.H. 1861 and Raquett River-Hogansburg, Pt. 2, St. Regis Indian Reservation-Fort Covington Pt. 1, S.H. 8396 Proj. F-580(15)	5 07	Asphalt Conc Ty. 1A Pavt. = 5.03 Mi.; Misc. Work = 0.04 Mi.; 2 Hy. Seps. Comp. WF Beams; 3 Sp. 166.5' and 3 Sp. 167.5'; 1 RR Sep. Comp. I-Beam Twin 2 Sp 160' Ea., 1 Br. Deck Girder Cant. Type Twin 5 Sp. 710' Ea.	$290,000 Plans $5	5,245,000
Jefferson (Int. Tour Rte. 81)	FISH 59-16	Interstate Route 505 Section 7 AB-2 (Pierrepont Manor to Adams) and S.H. 184; C.R. 107, C.R. 126, C.R. 112 & C.R. 110 Proj. I-81-3(13)135	5 57 (2 29 Acc.)	Asph. Conc. Type 1A Pavt. = 5.55 Mi. (M.L.) 2.29 Mi. (Acc.) Miscell. Work = 0.02 Mi.; 4 Hy. Seps. Twin Comp. I-Beams 3 Sp. 119'; 3 Sp. 144.3' and 146.8'; 3 Sp. 129.5', 3 Sp. 138.5' and 140', 1 Hy. Sep. R.C. Rigid Frame Twin 1 Sp. 41.8', 1 Br. R.C. Twin Box 42' Sp., 2 Twin Comp. I-Beam Brs., 3 Sp. 291' and 3 Sp. 262'	$320,000 Plans $10	$5,774,000
DISTRICT No. 8, KURT G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Rockland (Rte. 9W)	R.C. 59-116	New Jersey State Line-Nyack Pt. 2, S.H. 5711		Cleaning and Painting 1 Bridge	$900 Plans $5	16,000
Ulster	FASS 59-20	Hoagerburgh Hill Road Co. Rd. No. 70 (Bruynswick Bridge Co Br No 150); Proj S-527	1 35	Asph. Conc. Pavement Comp. I-Beam Br. 2 Sp. 186'	$17,000 Plans $5	313,000
DISTRICT No 9, Joseph C. Federick, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 17)	FARC 59-115	Windsor-Deposit, S.H. 5338; Binghamton-Windsor Pt. 4, S.H. 5241; Binghamton-Windsor Pt. 3, S.H. 5148; Windsor Village Main Street S.H. 1239 Proj. F-FG-311 (25)	6 31 (4 77 Acc.)	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide = 6.16 Mi (Access = 1.17 Mi. Cem. Conc. Pavt., 0.61 Mi. Asp. Conc. Pavt., 2.01 Mi. Bit. Surf. Treat. & 0.95 Mi. Gran. Mat.; Bit. Surf. Treatment = 0.15 Mi.; 8 Hy. Seps. Comp. Beams 131.4', 137.8', 123.6', 128.8', 192', 192', 139.5' and 142.8'; 2 RR Seps. Comp. Beams 224.7' and 249.7'; 7 Brs. Comp. Beams 139', 167', 105', 345', 345', 423.8' and 514'; 1 Br. Reinf. Conc. Box 23.4'	$550,000 Plans $10	$10,064,000
Chenango	FC 59-1	Newton Creek Bainbridge Flood Control Project	0 49	Furnishing & Erecting 5' Chain Link Fence	$1,100 Plans $10	20,000
Sullivan (Rtes. 209, 42, 52 & 55)	R.C. 59-103	S.H. 8287; S.H. 1478; S.H. 1708; S.H. 8153; S.H. 8171; S.H. 8335; S.H. 1601; S.H. 1837; S.H. 50-10 and S.H. 709		Roadside Development	$700 Plans $5	13,000
DISTRICT No. 10, M. L. GOUT, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Suffolk	O.P. 59-1	Ocean Parkway (Gilgo St. Park to Captree St. Parkway)	7 14	Landscaping and Miscell. Work	$22,000 Plans $5	398,000
Suffolk	FASH 59-13	Sunrise Highway Extension (S.H. 1883 to Springdale Road) Proj. F-559(12)	3 98 (3 39 Acc.)	9" Cem. Conc. Pavt. (Cart. Black) 2@ 24' Var. Wide = 3.28 Mi.; Miscell. Work = 0.70 Mi. (Access = 0.91 Mi. Cem. Conc. & 4.48 Mi. Asp. Conc.); 4 Hy. Seps. Comp. W-F Beams 3 Sp. 166', 3 Sp. 160.5', 3 Sp. 116.6', and 4 Sp. 239.3', 1 Hy. Sep. Plate Girder, 3 Sp. 199.7'	$220,000 Plans $5	4,016,000
Suffolk (Rte. 110)	FARC 59-10	Amityville Village: Broadway, S. H. 1633 Huntington-Amityville Pt. 2, S.H. 1219 Proj. U-297(5)	2 16	Asphalt Concrete Pavement = 2.10 Mi. Miscell. Work = 0.06 Mi.	$79,000 Plans $5	1,444,000
	Total 24 Contracts (23 Hy. and 1 Canal)		89 42			$38,210,600

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: August 18, 1959.

Proposed Improvements to the Sanitary Sewerage System of Seaford, Delaware

NOTICE TO BIDDERS

Sealed bids for the construction of proposed improvements to the sanitary sewerage system consisting of intercepting sewers, pumping station, sewage treatment plant and outfall sewer (Schedule A), extension of intercepting sewers (Schedule B), lateral sewers (Schedule C), and house connections (Schedule D), under Project No. WPC-Del-1, will be received by the City of Seaford at their temporary office located in the Fire Headquarters Building on King and Gannon Streets, in Seaford, Delaware, until 7:30 P.M. (E.D.T.) Tuesday, August 18, 1959, at which time and place the bids will be publicly opened and read aloud.

A summary of major items of work follows:

SCHEDULE A

4650 L.F. 8", 16", 18", and 24" C.I. Pipe Sewers; 1780 L.F. 12" and 15" Clay Pipe Sewers; 110 L.F. 48" Corrugated Metal Casing Tunnels with 18" C.I. Pipe Sewers inserted therein under Railroad Tracks; 32 Standard Manholes (280 V.F.); 9 Diversion Manholes; 15 MBM Timber Sheeting Left in Place and Creosoted Lumber in Foundation; 27 Creosoted Timber Pile Bents; 250 Tons Crushed Mineral Aggregate for Refill Below Subgrade; 350 C.Y. Select Material for Trench Refill; 100 Tons Crushed Mineral Aggregate for Temporary Repaving; 4650 S.Y. Concrete, Bituminous Concrete, and Macadam Surface Replacement; Sewage Treatment Plant (Primary Type), Complete, including Pumping Station, Grit Removal Chamber, Primary Tank; Digester, Glass Covered Sludge Beds, Chlorine Contact Tank and Related Equipment; Piping and Appurtenances (Water, Sewer, and Drainage on Site); Site Improvements; and Outfall Sewer.

SCHEDULE B

4030 L.F. 8" to 12" Clay Pipe Sewers; 21 Standard Manholes (230 V.F.); 150 MBM Timber Sheeting Left in Place and Creosoted Lumber in Foundation; 100 C.Y. Select Materials for Trench Refill; 200 Tons Crushed Mineral Aggregate for Temporary Repaving; 3500 S.Y. Bituminous Concrete and Macadam Surface Replacement.

SCHEDULE C

2650 L.F. 8" Clay Pipe Sewers; 10 Standard Manholes (70 V.F.); 100 Tons Crushed Mineral Aggregate for Temporary Repaving; 1180 S.Y. Macadam Surface Replacement; 60 S.Y. Concrete Sidewalk Replacement; and 270 L.F. Concrete Curb Replacement.

SCHEDULE D

1965 L.F. 6" C.I. and Clay Pipe House Connections and Stacks; 50 C.Y. Select Materials for Trench Refill; 10 Tons Crushed Mineral Aggregate for Temporary Repaving; 640 S.Y. Macadam Surface Replacement; 120 S.Y. Concrete Sidewalk Replacement; and 370 L.F. Concrete Curb Replacement.

This project will be financed with funds furnished by the City of Seaford, together with Federal grants obtained under the provisions of Public Law 660.

The attention of bidders is directed to the Special Conditions covering this work, which include the Anti-Kickback Regulations issued by the Secretary of Labor (29 CFR Part 3) and other special requirements.

Plans, specifications, and other contract documents may be examined at the office of Woodrow W. Crosby, City Manager of the City of Seaford, located in the Fire Headquarters Building on King and Gannon Streets in Seaford, Delaware, or may be obtained from the office of Clarke Gardner and Percy Sterling, Consulting Engineers, Calvert and Bond Streets, Salisbury, Maryland, upon deposit of $35.00 for the initial set and $25.00 for each additional set. If the documents are returned in good order within 30 days after the opening of bids, the full amount of the original deposit for one set will be returned to each actual bidder. A refund of $10.00 will be made to non-bidders or for each additional set of documents obtained by bidders.

Each bid must be accompanied by a properly prepared bid bond satisfactory to the City of Seaford in an amount not less than 5% of the total of the bid for Schedules A, B, C, and D.

Approved Performance and Payment Bonds, each in the amount of 100 percent of the Contract as awarded, will be required from the successful bidder.

No bidder may withdraw his bid within 45 days after the actual date of the bid opening.

The City of Seaford reserves the right to consider informal any bid not prepared and submitted in accordance with the provisions of the Contract Documents, and may waive any informalities in or reject any and all bids.

CITY OF SEAFORD
Woodrow W. Crosby
City Manager

July 16, 1959

Bids: July 23, 1959

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., advanced standard time, which is nine-thirty o'clock A. M., eastern standard time, on the 23rd day of July 1959, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York		
St. Lawrence (Rtes. 37 37A & 87)	FATs 59-11	City of Ogdensburg: Route 37 Arterial, FAC 37-16 Ogdensburg: Route 37 Connections, FASH 37-19 Ogdensburg-Morristown, Pt. 1 S.H. 878 Ogdensburg-Waddington, Pt. 1 S.H. 5497 Ogdensburg-Waddington, S.H. 9357 Project U-650(8)

Miles	Type	Deposit	Estimated Cost of Work
6.13	Traffic Signs and Delineators	$1,900 Plans $5	$34,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: July 30, 1959.

Contract O & M—537

THE PORT OF NEW YORK AUTHORITY
HOLLAND AND LINCOLN TUNNELS
PAVEMENT RESURFACING—NORTH AND SOUTH TUBES OF HOLLAND TUNNEL—HELIX AND NORTH TUBE OF LINCOLN TUNNELL

Sealed proposals for furnishing all labor, material and equipment for resurfacing pavement in the North and South Tubes of the Holland Tunnel and the Helix and North Tube of the Lincoln Tunnel will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A. M., Thursday, July 30, 1959, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, July 16, 1959

Bids: August 4, 1959

Power Authority of The State of New York

NIAGARA POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF GENERATOR HATCH COVERS FOR LEWISTON POWER PLANT
SPECIFICATION NO. PA-N-23024
NIAGARA CONTRACT NO. NP 38

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for the Furnishing and Delivery thereof, F.O.B. University Siding, Lewiston Power Plant Area, Niagara Falls, New York, for Thirteen (13) Two-Section, Mobile, Unit Hatch Covers for the Lewiston Power Plant in Lewiston, Niagara County, New York until 10:30 A.M. Eastern Daylight Saving Time on the 4th Day of August, 1959, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be received for furnishing and delivery of thirteen (13) Hatch Covers complete with appurtenances for the thirteen (13) Unit Generators for the Lewiston Power Plant. The total weight of the Hatch Covers is approximately 420 Tons. Erection at the site of installation will be done by others. First delivery will be required April 15, 1960.

All work shall be completed on or before January 1, 1961.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten ($10.00) Dollars, per initial set of contract documents, and Five ($5.00) Dollars per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston, Massachusetts and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 per cent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-N-23024

OFFICIAL PROPOSALS

Bids: August 18, 1959.

Contract GWB-190.025

THE PORT OF NEW YORK AUTHORITY
GEORGE WASHINGTON BRIDGE
LOWER LEVEL EXPANSION
NEW JERSEY APPROACH
PHASE 4

Sealed proposals for the construction of an approach roadway system for the Lower Level Expansion of the George Washington Bridge between Fletcher Avenue and Lemoine Avenue in the Borough of Fort Lee, New Jersey will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, August 18, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $100.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $100.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, July 16, 1959

Bids: August 4, 1959.

Contract NYA-120.009

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
FUEL TRUCKS PARKING AREA
PAVING AND UTILITIES

Sealed proposals for the construction of paving and utilities for a fuel truck parking area at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, August 4, 1959, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, July 16, 1959

Bids: August 6, 1959.

Contract O & M—533

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
MISCELLANEOUS PAVING AND
PAVEMENT RESURFACING

Sealed proposals for furnishing all labor, material and equipment for paving and resurfacing pavement in various locations at New York International Airport, New York will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A. M., Thursday, August 6, 1959, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, and you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, July 16, 1959

Bids: August 3, 1959.

Interceptor Sewer
New Castle County, Delaware

SEALED PROPOSAL—Addressed to the President of the Levy Court of New Castle County for the construction of an interceptor sewer extending from the Pennsylvania-Delaware state line at Naaman's Creek in a southerly direction to the intersection of Governor Printz Boulevard and Tower Street, Brandywine Hundred, entitled "Upper Chichester Interceptor, Contract 1959-4", will be received from qualified bidders by the County Engineer in Room 202 of the New Castle County Engineering Building, on the Kirkwood Highway, until 2:00 P.M. Daylight Saving Time, Monday, August 3, 1959. All bids will be opened and read in the Hearing Room of the New Castle County Engineering Building on said day.

The work embraces the construction of a sanitary interceptor sewer approximately 10,400 linear feet in length, varying in size from 24 inches to 16 inches in diameter, and the construction of a sewage flow Meter House. There is a grant of funds from the Public Health Service in connection with the project.

Each bid shall be accompanied by a certified check or surety bond in the amount of ten percent (10%) of the total bid.

Plans and specifications may be obtained at the New Castle County Engineering Building on the Kirkwood Highway, Room 103 or Whitman, Requardt and Associates, 1304 St. Paul Street—Baltimore 2, Maryland, on and after July 8, 1959, upon payment of the sum of $5.00 which will not be refunded.

The Levy Court reserves the right to reject any and all bids received, and to waive any informalities in the bids received.

JOHN TAYLOR
County Engineer

Bids: September, 1959.

Invitation YS-2-12, Trashrack and Slot Cover Materials, for the Yanhee Multipurpose Project.

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

INVITATION FOR BIDS—NO. YS-2-12

The Royal Irrigation Department of the Kingdom of Thailand hereby invites sealed written bids for furnishing and delivering the following goods, equipment, and materials either fob Contractor's Dam and Power Plant, Yanhee Multipurpose Project, Kingdom of Thailand, in accordance with the Contract Documents, Invitation for Bids—No. YS-2-12, for:

Furnishing one lot of 250 tons of hot rolled steel bars and shapes and 3,300 square feet of welded type floor grating.

Bids will be issued in July 1959 and will be opened in September 1959. Copies of Contract Documents, Invitation for Bids—No. YS-2-12 may be obtained by qualified Bidders on written request on Bidder's letterhead, addressed to:

Royal Irrigation Department
Attention: Thai Liaison Engineer
c/o Engineering Consultants, Inc.
1940 West Mississippi Avenue
Denver 23, Colorado

Each request must be accompanied by a check or money order, payable to the Royal Irrigation Department, in the amount of U. S. $5.00 for each copy of the Contract Documents requested. The remittance is nonreturnable.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department
Kingdom of Thailand
Bangkok, Thailand

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5218) will be received at Collbran, Colorado, until 10 a.m., Mountain Standard Time, August 11, 1959, for furnishing labor and materials for earthwork and structures Southside Canal, Station 1146+49 to end, Collbran Project, Colorado. Location southwest of Collbran, Colorado. Principal items are 353,000 cu. yds excavation; 960 cu. yds. concrete; 6,134 lin. ft. concrete culvert pipe, 15- to 48-inch; 2,126 lin. ft. concrete pressure pipe or pretensioned concrete pipe, 39- to 48-inch; various—furnishing and installing materials; and other work. Completion time 425 days. For particulars, Address Bureau of Reclamation, P. O. Box 396, Collbran, Colorado; P. O. Box 360, Salt Lake City 10, Utah, or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5219) will be received at Camp White, Oregon, until 10 a.m., Pacific Standard Time, August 18, 1959, for furnishing labor and materials for Billings Siphon—West Lateral Rehabilitation, Talent Division, Oregon, Rogue River Basin Project. Location near Ashland, Oregon in Jackson County. Principal items are 10,000 cu. yds. excavation; 6,650 lin. ft., 30-in. diameter (steel or pretensioned concrete) pipe siphon; and other work. The work is to be performed under one of two alternate schedules. Completion time 210 days. For particulars, address Bureau of Reclamation, P. O. 386, Camp White Oregon; P. O. Box 937, Boise, Idaho; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

FEDERAL AVIATION AGENCY. Sealed bids (Invitation No. 0-3082B1) will be received at Washington, D. C., until 2:00 p.m., EDST, Wednesday, August 12, 1959, for furnishing, delivery, erection, testing and supervision of startup of two (2) high temperature water boilers with fuel burning equipment; two (2) centrifugal refrigeration machines; and one (1) cooling tower, all complete with accessories, in connection with the development of the Washington International Airport in Fairfax and Loudoun Counties, Virginia. Bid forms and specifications may be obtained from the Procurement Branch, Federal Aviation Agency, Room 2615, T-5 Building, Washington 25, D. C. No deposit will be required.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5220) will be received at Casper, Wyoming, until 10 a.m., Mountain Standard Time, August 13, 1959, for furnishing labor and materials for Gray Reef Dam, Glendo Unit, Wyoming, Missouri River Basin Project. Location 27 miles southwest of Casper, Wyoming, in Natrona County. Principal items are 50,000 cu. yds. excavation; 44,000 cu. yds. embankment; 3,800 cu. yds. concrete; and other work. Completion time 600 days. For particulars, address Bureau of Reclamation, P. O. Box 280, Casper, Wyoming; Building 46, or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for building extension at the U. S. Post Office, Haddonfield, New Jersey, will be received until 2:00 P.M., EDST, August 4, 1959, and then publicly opened. Bidding materials may be obtained from the Business Service Center, Ground Floor, General Services Administration 250 Hudson Street, New York 13, N. Y., or from the Custodian of the Building where the work is to be done.

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Structural Engineer with pleasing personality plus structural design or construction experience for promotional and client contact in eastern United States. Prior client contact experience not required though desirable. Salary open. Send detailed resume to Buchart Engineering Corp., York, Penna.

Cement Chemist: To conduct both chemical and physical tests of Portland Cement for determining its compliance with ASTM and Federal Specifications on long paving program. Minimum requirements: BS degree, 3 years experience in similar position. P. O. Box 116, Lombard, Illinois.

Chief Engineer-Estimator. Well known and established Massachusetts corporation desires man qualified by experience and education for estimating and prosecution of highways, bridges, foundation, dams, etc. Please submit resume and present salary. P-1994, Engineering News-Record.

Civil engineers and civil draftsmen with 2 to 3 years office experience for responsible permanent position with progressive consultants in San Diego rural area. Salary range $500. to $800. Send full resume and availability to P-1968, Engineering News-Record.

Project Manager, highway and railroad, with experience in supervision of jobs in the one to four million dollar size, including excavation, paving, bridges, utilities. Work in Ohio-Indiana area. Submit resume of qualifications and salary required. P-1977, Engineering News-Record.

Engineer-Estimator to work out of Omaha, Nebraska on heavy construction and highway estimates. Submit resume of qualification and salary expected. P-1973, Engineering News-Record.

Construction Superintendents. C.E. Georgia, Missouri & Arkansas. Must be experienced, General Construction Public Works. Send resume, age, education, previous experience, references, salary desired. P-2136, Engineering News-Record.

Wanted: Heavy Construction Project Manager. Minimum of 15 years experience in the U.S.A. Permanent Position. Salary open for the right man. Company doing business through the U.S.A. P-2135, Engineering News-Record.

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"Project Engineer for route location studies and report writing.
Project Engineer to handle the design and preparation of contract plans for rural and urban interstate highways.
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Designer experienced in the design of interchanges and interstate highways.

Please give employment history, references and salary desired in first letter. Address all replies to:

P-2045, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Excellent opportunity in Virginia and Carolinas sales territory of major chemical corporation for graduate engineer 27-35 years desiring sales, promotion and construction work in an expanding market. Highway and concrete engineering background desirable for contacts with highway departments, contractors and concrete product companies.

Permanent position with excellent opportunity for advancement. Attractive salary, company car and expenses with liberal company sponsored benefits.

P-2042, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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HEAVY EARTHWORK
UNITED STATES

Graduate Engineer under 40 years of age. Background must include detailed knowledge of the correct operation, maintenance and repair of all types of heavy earth moving equipment. Experience required in Rock and Wet excavation including Scraper and Long Haul operation. Excellent opportunity for man with the above qualifications and proven administrative ability. Send detailed resume of experience and references to

P-2041 Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

• POSITIONS VACANT

Civil Engineer with experience in sanitary design work. Needed immediately. Established consultant in Ohio. Give resume and salary requirements. P-2092, Engineering News-Record.

Civil Engineer: Registered C.E. capable of organizing and running a consulting firm. Opportunity to become a principle. Location Maryland. P-2121, Engineering News-Record.

Estimator—Top pay and working conditions for a fully experienced productive competitive estimator. Wingate Construction Company, 34 17th St., Phila. 3, Pa.

Civil Engineer for North Jersey general contractor. Estimating, office engineering etc. Age 22-26. Send resume. P-2129, Engineering News-Record.

Building Construction Superintendents wanted by well established Construction Company located deep south. Must be capable of supervising all types of building construction from $500,000.00 to $5,000,000.00. Permanent position for right parties. Submit resume giving availability, experience, education, references and salary expected. Replies held confidential if requested. P-2100, Engineering News-Record.

(Continued on the following page)

BUILDING DESIGNERS

Positions available in consulting firm for Engineers, Architects and Architectural Draftsmen experienced in building design. Send personal information and experience record to:

STANLEY ENGINEERING COMPANY
Hershey Building Muscatine, Iowa

BRIDGE DESIGNER

Engineer capable of complete charge of Highway Bridge Section. Minimum 10 years experience. Dealing directly with Municipal and State Highway Departments. Work in Midwest Area.

P-2043, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

• POSITIONS VACANT
(Continued from preceding page)

City Engineer—Registered Civil Engineer of the State of Florida—Salary $6,000.00-$7,-500.00. Kindly send resume to G. F. Althouse, City Auditor and Clerk, City of Ormond Beach, Florida, P. O. Box 695. All replies confidential.

Asst. Prof.—To teach undergrad. courses in transportation, surveying, and fluid mechanics. Salary open. Civil Eng., University of No. Dak., Grand Forks.

• POSITIONS WANTED

Civil Engineer, 26, married, very interested in earth and rock excavating equipment desires challenging job with contractor, equipment dealer or manufacturer. Since graduation in 1955, worked 6 months as equipment operator, 3 years in construction branch of Fed. Gov. on highway, tunnel, and channel improvement jobs and 6 months with Fed. Gov. making time studies of equipment performance. Will relocate—available on 3 weeks notice—resume on request. PW-2055, Engineering News-Record.

Heavy Equipment Supervisor, age 35, 17 yrs exp. dams, power plant, roads, preventive maint. Resume upon request. John C. Melton, Birdsong Road, Camden, Tennessee. Pho. LU 4-7901.

Mechanical engineer or designer; over twenty years diversified field and office experience, including supervision. Process, power, and other. Prefer field assignment, but office acceptable. Bob Mills, 219 N. Jefferson, Kittanning, Penna.

Consulting engineer for foundations of buildings, bridges and highways. M.ASCE and A.C.I., 30 years experience in Europe and America in reinforced concrete especially in design and execution of heavy raft-mort-and pile foundations want collaboration with consulting or contractor films specialized in this field. As author of many scientific papers, published in the U.S.A. and Europe about modern methods of foundation design is also interested in research work of soil mechanics and foundation engineering. Tel.: New York City, Plaza 5-2263.

Field and layout engineer B.S.C.E. 18 years experience—steam plant, lock, dam, and building-supervision several parties—charge of civil, structural and architectural aspects of related construction. South preferred. PW-2029, Engineering News-Record.

Bituminous, Soil, Concrete Paving Tech-nologist. ICS Graduate. 20 years with Tollroads, overseas air-ports, city streets, highways, dams field, office and laboratory. Single, 47. Immediately available. Expert in scientific design of asphaltic mixtures. A. B. Hart, 809 Arlington, Jackson, Miss. Phone FI-2-1239.

Teaching or advisory. PhD struct. eng. 10 years research and teaching experience. Past 6 years successful industrial design and consulting. Age 42. Present income $12-$15,000. Resume available. PW-1970, Engineering News-Record.

Const. Executive-Gen. Supt. Age 38. Man-aged Heavey const. Co. 12 yrs. Roads, Airports, earthmoving, foundations, etc. Estimating, organizing, completing. Negotiations for extras etc. Prefer to associate small or medium Co. to manage or take load off busy owner. Will relocate. $10-$15,000. PW-1983, Engineering News-Record.

Construction Executive and General Superin-tendent, 25 years experience in commercial, industrial, public buildings, and mass housing, experience includes all phases of construction, job management, purchasing, subcontracting, processing of claims, etc. Desire permanent relocation eastern U. S. PW-1006, Engineering News-Record.

Materials and Soils Engineer—BSCE—Over 10 years experience in construction of highways, toll roads and dams with both consultants and public agencies. PW-1985, Engineering News-Record.

Young Civil Engineer-2 years general field experience. Desires heavy construction field work. Preferably overseas. PW-1938, Engineering News-Record.

Foreign or Domestic—Top level tunnel super-intendent. Age 46—background of successful tunnels, shaft's, caissons, underground powerhouses, well versed cost wise, can get top production—help estimate. Resume on request. PW-2001, Engineering News-Record.

Project Manager. Proven 20 Year Record heavy construction. U.S. and foreign. PW-1883, Engineering News-Record.

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Executive, 23 Years Top Level Management and administration all phases of heavy construction. PW-2012, Engineering News-Record.

Heavy Construction Superintendent 18 years experience dock construction, pile dri ing, bridges and dams desires position with responsibility and future. PW-2137, Engineering News-Record.

Civil Engineer, MCE, 35, Registered, with wide experience in supervision of major hiway, airport and earthfill dam projects seeks position with engineer or contractor, domestic or foreign. Fluent Spanish. PW-2104, Engineering News-Record.

Construction engineer, 32, for heavy con-struction in West. Assist. Supt. layout work, engineer experienced in design, construction, and detailing for Reinforced concrete and pre-cast concrete. Available August. PW-2101, Engineering News-Record.

Graduate Civil Engineer, 30, experienced, also B.S. in Forestry, desires position with municipality or diversified business. Available September. PW-2093, Engineering News-Record.

Civil Engineer, German degree, 28 years old, 5 years exper. in dam, water supply, sewerage and growing buildings, also surveying. PW-2097, Engineering News-Record.

Civil Engineer—Fully qualified British Civil Engineer (B.Sc.(Eng) London. A.M.I.C.E.), 40 years old, with 19 years experience of planning, estimating, and construction in the West Indies, Middle East, Malaya and Canada, particularly in connection with irrigation, drainage, sea defences, and hydro-electric work, seeks responsible appointment with international Consulting Engineers or Contractors who can use mature experience. For full resume write PW-2103, Engineering News-Record.

Shovel Salesman, available July 31st. Manu-facturer or Distributor. Experienced also Tractors, Compressors, Pumps, Pavers, etc. PW-2130, Engineering News-Record.

• POSITIONS WANTED

Sanitary Engineer, 29, BSCE, 6 years experi-ence in sewage and water works design. Excellent qualifications. Permanent position desired in Midwest or East with progressive firm or municipality. PW-2133, Engineering News-Record.

Construction Executive and Administrator— Presently Director, Vice President and Treasurer of large engineering and construction firm handling domestic and foreign business. Responsible for financial, banking and general business operations of the company. Responsible for tax matters. Experienced in all phases of management control, corporate administration, budgetary and cost control. Experienced in forming and operating foreign companies. Engineering and construction experience has been on or connected with every type of heavy and building construction in various positions as estimator, engineer, superintendent and branch manager. Member ASCE, Military Engineers, The Moles and Amer. Management Association. PW-2138, Engineering News-Record.

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Require man experienced in designing conduit plans, cable systems, physical layouts, wiring diagrams, lighting systems, and other electrical features of hydroelectric powerplant design. Board work. Send resume to Mr. James E. Collins, Personnel Manager.

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Medium sized eastern Consulting Engineering firm is interested in expanding its operations in the United States by merger or purchase of an established engineering practice. BO-1991, Engineering News-Record.

Civil Engineer: Registered C.E. capable of organizing and running a consulting firm. Opportunity to become a principle. Location Maryland. BO-2127, Engineering News-Record.

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FS-2040, Engineering News-Record
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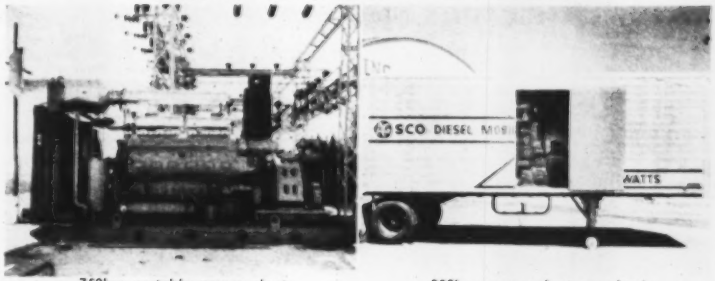

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FS-2134, Engineering News-Record
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Housing: One Thing at a Time

THE PRESIDENT'S VETO of the omnibus housing bill last week should not have surprised anyone. As anticipated, the President was able to point to many provisions in the bill that could be considered inimical to the best interests of the country (see p. 26). And there are some provisions in it that conceivably might not even be good for homebuilders.

The bill increased subsidies for public housing, college housing and slum clearance. It also subsidized builders by providing for Federal National Mortgage Association purchases of mortgages at par without regard to open-market prices. There may be some excuse for private enterprise turning to the federal government for help when it is in trouble, but what justification is there for increased subsidies when house construction is at a near-record level? The President could find none.

In this time of prosperity, homebuilders have an opportunity to develop means of making government aid unnecessary and thus ridding themselves of government controls. If, until they do this, some housing legislation is necessary, it should be in separate bills aimed at achieving specific objectives and not in a catch-all measure that mixes the bad with the good.

One of these highly desirable objectives is for Congress to eliminate the need for passing annually a measure increasing the insurance authority of the Federal Housing Administration. This authority does not involve federal spending or lending and does not cost the taxpayer a cent. Yet, in the past, the necessity of waiting for Congress' approval of an extension of insurance authority has slowed housing construction painfully.

If there has to be housing legislation, it should be of such a nature as to permit homebuilding to be planned for long periods ahead and homebuilders to become self-sufficient. An important first step in this direction would be taken if Congress would eliminate the ceiling on FHA insurance authority.

Successful Recruiting

LAST YEAR the Pennsylvania Highway Department had the benefit of some constructive criticism in the findings of an Automotive Safety Foundation study of its operations (ENR Sept. 4, p. 27). Among other things, ASF told the state highway department to recruit more young men and develop training programs.

A recent edition of a state capital news bulletin reports that of 105 engineering trainees hired by the department in a recruiting program established 18 months ago, only two were lost to private employment and one to military service. This sounds good indeed.

The department's new training program appears to have held its first group of trainees remarkably well. It must be hoped that as they graduate from the $5,268 trainee salary to more productive positions at increased pay, they will serve the Pennsylvania Highway Department well and long. For its commendable effort, it deserves that reward.

Survival Shelters No Answer

DESPITE SERIOUS DOUBTS that a massive shelter construction program would materially help the civilian population survive a nuclear bomb attack, the shelter idea persists. The latest proposal comes from New York, where a committee appointed by the governor recommends legislation to make building fallout shelters compulsory. Each home and building owner would be required to provide his own, and all new building plans would have to include shelters (see p. 27).

Aside from the cost, which is estimated at $2.5 billion for the state as a whole, the usefulness of shelters to assure survival is seriously open to question. Obviously only those people outside the bomb destruction area would be alive to use a shelter. Also, the New York report assumes they would have to stay in the shelter for at least two weeks until the fallout effect dissipated, so food and water would have to be stocked. The report does not say what they would eat after they emerged, since presumably all the food animals would be dead or contaminated, and all stored food supplies would be dangerously radioactive. Even as a calculated risk, a massive shelter program has little to recommend it.

Obviously, the aftermath of a nuclear bomb attack is so appalling to contemplate that it is imperative to continue to seek ways to combat it. But just doing something is not necessarily better than doing nothing.

With our present scanty knowledge of how to protect against fallout, our fears that people wouldn't or couldn't live in the shelters we build, and all of the other doubts and unknowns, a massive shelter program is a highly questionable form of defense. Even were it considerably more promising, the task of selling a shelter program to the public would be well nigh impossible, considering the dismal record of civil defense to date.

The only presently hopeful defense against nuclear attack is to deter the firing of enemy missiles by being strong enough to retaliate in kind. Our money is being spent on that kind of defense now. If we have to spend $15 billion more on defense (the estimated cost of a nation-wide shelter program) it would be better spent on more deterrent weapons. Or even in sound investments abroad that would promote hope and higher living standards, and thus make peace more sought after. In overemphasizing the need to prepare for the worst, as a survival shelter program does, we court the danger of neglecting to strive for the best—a world in which everyone can live in peace and growing abundance.

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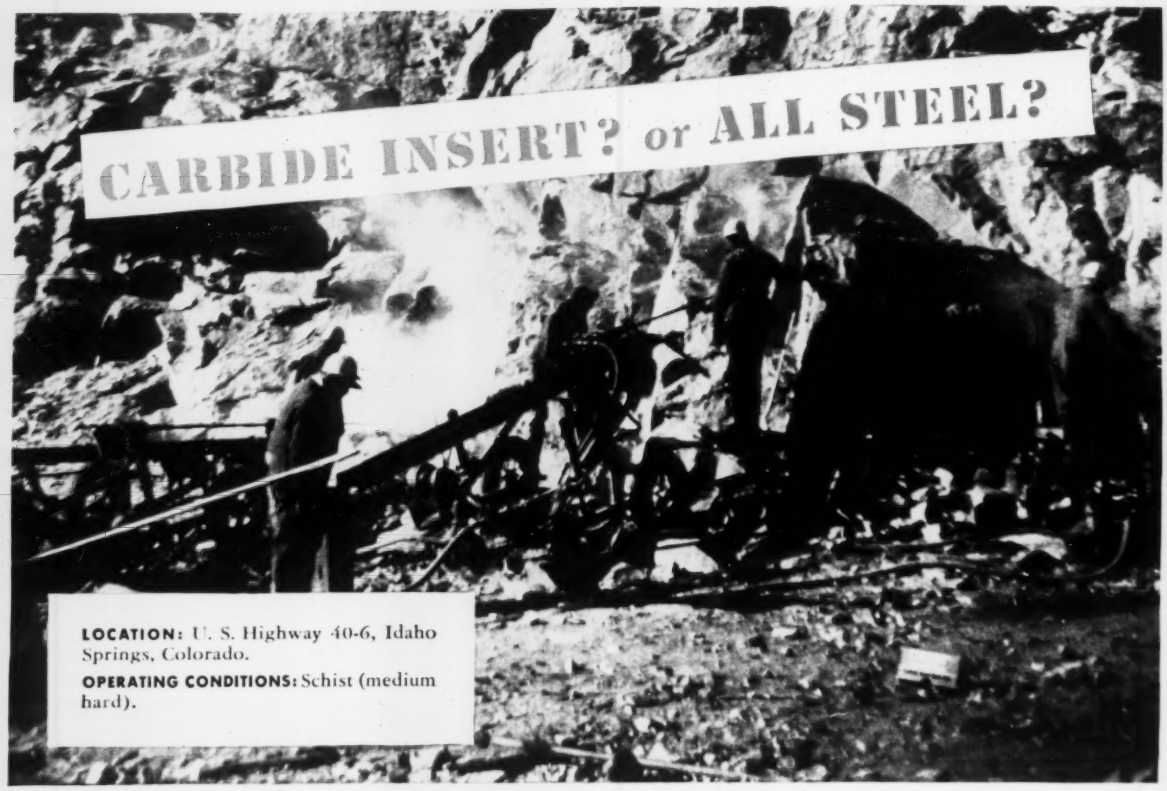

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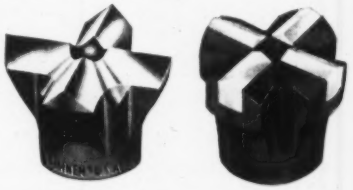

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